AFRL-SA-WP-TR-2017-0021

Reassessment of Self-Reported Behavioral Health Habits and Other Issues Among Distributed Common Ground System Intelligence Operators and Non-Combatant Support Personnel

Lillian Prince[1], MSSI; Tanya Goodman[2], MS; Sabera Mosley[2], PhD; Wayne Chappelle[3], PsyD; William Thompson[2], MA

[1]Prince Research and Analytic Services, Birmingham, AL; [2]Neurostat Analytical Solutions, Alexandria, VA; [3]U.S. Air Force School of Aerospace Medicine, Aeromedical Research Department, Wright-Patterson AFB, OH

October 2017

Final Report for
May 2015 to September 2017

Air Force Research Laboratory
711th Human Performance Wing
U.S. Air Force School of Aerospace Medicine
Aeromedical Research Department
2510 Fifth St., Bldg. 840
Wright-Patterson AFB, OH 45433-7913

NOTICE AND SIGNATURE PAGE

Using Government drawings, specifications, or other data included in this document for any purpose other than Government procurement does not in any way obligate the U.S. Government. The fact that the Government formulated or supplied the drawings, specifications, or other data does not license the holder or any other person or corporation or convey any rights or permission to manufacture, use, or sell any patented invention that may relate to them.

Qualified requestors may obtain copies of this report from the Defense Technical Information Center (DTIC) (http://www.dtic.mil).

AFRL-SA-WP-TR-2017-0021 HAS BEEN REVIEWED AND IS APPROVED FOR PUBLICATION IN ACCORDANCE WITH ASSIGNED DISTRIBUTION STATEMENT.

//SIGNATURE//	//SIGNATURE//
DR. JAMES McEACHEN	DR. RICHARD A. HERSACK
CRCL, Human Performance	Chair, Aeromedical Research Department

This report is published in the interest of scientific and technical information exchange, and its publication does not constitute the Government's approval or disapproval of its ideas or findings.

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*	**2. REPORT TYPE**	**3. DATES COVERED *(From – To)***
28 Oct 2017	Final Technical Report	May 2015 – September 2017

4. TITLE AND SUBTITLE
Reassessment of Self-Reported Behavioral Health Habits and Other Issues Among Distributed Common Ground System Intelligence Operators and Non-Combatant Support Personnel

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)
Lillian Prince, MSSI; Tanya Goodman, MS; Sabera Mosley, PhD; Wayne Chappelle, PsyD; William Thompson, MA

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
USAF School of Aerospace Medicine
Aeromedical Research Dept/FHO
2510 Fifth St., Bldg. 840
Wright-Patterson AFB, OH 45433-7913

8. PERFORMING ORGANIZATION REPORT NUMBER

AFRL-SA-WP-TR-2017-0021

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSORING/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT

DISTRIBUTION STATEMENT A. Approved for public release. Distribution is unlimited.

13. SUPPLEMENTARY NOTES
Cleared, 88PA, Case # 2017-6293, 14 Dec 2017.

14. ABSTRACT

The distributed common ground system (DCGS) community assigned to the U.S. Air Force 480th Intelligence, Surveillance, and Reconnaissance Wing is responsible for around-the-clock analysis and exploitation of real-time, critical information in support of combat operations and in decision-making regarding global issues of national interest. Maintaining an accurate understanding of health and wellness trends among DCGS personnel is essential to sustaining this critical intelligence (intel) capability. A total of 1717 active duty intel, 394 active duty non-intel, 312 Air National Guard/Reserve intel operators, and 73 Air National Guard/Reserve non-intel personnel from DCGS locations from multiple squadrons across the globe completed the web-based psychological health behaviors survey. The estimated overall response rate was 24% for the Total Force DCGS community. Statistical analyses were performed to assess between-group differences to quantitative and qualitative psychological health behavior items assessing (a) the amount of sleep obtained before work and the frequency of engaging in structured physical exercise throughout the week; (b) the amount, frequency, and increase in consumption of alcohol, tobacco, and caffeine and the reasons for increased consumption; (c) medical conditions worsened by current unit assignment and occupational stress; (d) changes in healthcare utilization since being assigned to their current duties and the reasons for these changes; and finally (e) increases in medication utilization since being assigned to their current duties and the reasons for such increases. A series of comparisons with a previous, similar study is conducted, and recommendations are provided for line and medical leadership to assist in force management efforts focused on optimizing health within the DCGS Total Force community.

15. SUBJECT TERMS
Distributed common ground system, DCGS, intelligence, remote warriors, health behavior

16. SECURITY CLASSIFICATION OF:			**17. LIMITATION OF ABSTRACT**	**18. NUMBER OF PAGES**	**19a. NAME OF RESPONSIBLE PERSON**
a. REPORT	**b. ABSTRACT**	**c. THIS PAGE**			Wayne Chappelle, PsyD
U	U	U	SAR	79	**19b. TELEPHONE NUMBER *(include area code)***

This page intentionally left blank.

TABLE OF CONTENTS

Section **Page**

TABLE OF CONTENTS (concluded)

Section **Page**

LIST OF TABLES

Page

LIST OF TABLES (concluded)

Page

1.0 EXECUTIVE SUMMARY

The distributed common ground system (DCGS) community assigned to the U.S. Air Force (USAF) 480th Intelligence, Surveillance, and Reconnaissance Wing is responsible for around-the-clock analysis and exploitation of real-time, critical information in support of combat operations and in decision-making regarding other global issues of national interest. Although these operations are conducted remotely, the demand for DCGS capabilities has increased exponentially over the past 10-15 years, resulting in a continual, 24/7, high operational tempo work environment that requires constant mental vigilance on the part of its operators. Sustainment of this level of performance is essential to mission success and the prevention of unnecessary loss of life and brings with it the risk of stress-related health impacts on DCGS personnel.

Maintaining an accurate understanding of health and wellness trends among DCGS personnel is essential to sustaining this critical intelligence capability. The DCGS workforce is heavily composed of intelligence operators, is sustained by a technically oriented support component, and is increasingly Total Force in nature. Garnering current data on the health trends among DCGS active duty intelligence (intel) operators, support personnel, as well as the Air National Guard (ANG) and Reserve personnel who work this mission, is critical to fully appreciating the health status of the total USAF DCGS community and to ensuring force readiness across the DCGS architecture. Based on this informational need, in 2016 the USAF School of Aerospace Medicine conducted a follow-on effort to the 2013-2014 survey of health behaviors among intelligence, surveillance, and reconnaissance personnel. In so doing, the USAF School of Aerospace Medicine aeromedical operational psychology research team reassessed key health-related behaviors and trends (i.e., sleep and exercise; alcohol, tobacco, and caffeine use; rates and reasons for seeking medical care and mental health support services; and rates and reasons for increased prescription and over-the-counter medication usage) to identify shifts in relevant health patterns since the last study and to understand health-related needs and issues specific to this Total Force community.

A total of 1717 active duty intel, 394 active duty non-intel, 312 ANG/Reserve intel operators, and 73 ANG/Reserve non-intel personnel from DCGS locations from multiple squadrons across the globe completed the web-based psychological health behaviors survey. The estimated overall response rate was 24% for the Total Force DCGS community. Statistical analyses were performed to assess between-group differences to quantitative and qualitative psychological health behavior items assessing (a) the amount of sleep obtained before work and the frequency of engaging in structured physical exercise throughout the week; (b) the amount, frequency, and increase in consumption of alcohol, tobacco, and caffeine and the reasons for increased consumption; (c) medical conditions worsened by current unit assignment and occupational stress; (d) changes in healthcare utilization since being assigned to their current duties and the reasons for these changes; and finally (e) increases in medication utilization since being assigned to their current duties and the reasons for such increases. A series of comparisons with a previous, similar study is conducted, as well as several recommendations are provided for line and medical leadership to assist with force management efforts focused on optimizing health within the DCGS Total Force community.

2.0 INTRODUCTION

The distributed common ground system (DCGS) community, as the name suggests, is globally distributed and composed of an array of intelligence, surveillance, and reconnaissance (ISR) communications and support personnel across active duty, Air National Guard (ANG), and U.S. Air Force (USAF) Reserve units (i.e., Total Force). Known as the "eyes and ears" of the battlefield, the men and women of the DCGS community are tasked to provide 24/7 support to combat operations and critical missions around the globe. Although physically removed from the battlefield, they remain nonetheless engrossed in the combat environment.

The 480th ISR Wing, headquartered at Langley Air Force Base, VA, operates and maintains the DCGS weapon system capability. The manpower within the USAF DCGS community is primarily composed of intelligence (intel) operators whose job focuses on the exploitation of visual and technical information. In addition, there are support personnel whose task it is to provide technical system support and network sustainment to ensure continuity of the DCGS capability [Prince L. Personal communication; 2014 Jan].

The remote nature of DCGS operations has its operators perpetually "deployed-in-garrison." While physically safe, these personnel are directly and continuously involved in combat and combat support operations spanning the globe, and with this comes risk of negative occupational health impacts to members of this critical workforce. Increasingly a Total Force endeavor, the current number of required DCGS missions necessitates intel operators and support personnel from the ANG and Reserves to carry out workloads and an operational tempo that are comparable to those on active duty. Understanding the health implications across the Total Force is critical to developing relevant outreach strateties for supporting the DCGS community.

The first comprehensive assessment of occupational health trends within the USAF DCGS arena was conducted in 2013-2014 by the USAF School of Aerospace Medicine's (USAFSAM) aeromedical operational psychology reseatch team. The assessment offered unprecedented insight into health-related behaviors (i.e., alcohol, tobacco, and caffeine use; sleep and exercise patterns; reasons for seeking medical care and mental health support services; and increased prescription and over-the-counter (OTC) medication usage) among DCGS intel operators and support personnel. The study brought to light an array of health trends, lifestyle patterns, and access to healthcare considerations unique to the DCGS community. Approximately 65% of intel operators reported regularly sleeping 6 hours or less. Nearly 38% reported infrequent exercise (two times or less per week). Increased alcohol use was reported by 17% of intel operators, as was increased medication use (16-18%). Support personnel, by comparison, reported largely the same rate of low sleep (62%), a notably lower rate of infrequent exercise (28%), half the rate of increased alcohol use (8%), and a similar rate of increased medication use (11-17%) [1]. Sub-group differences aside, trends from the 2013-2014 study identified health considerations that warranted the attention of line leaders and their supporting medical providers. Since that time, these leaders have diligently pursued strategies to provide tailored healthcare options via embedded care providers. This study reexamines the aforementioned health-related variables to determine if recent integrated operational healthcare initiatives have begun mitigating health concerns within the DCGS community.

The 24/7 nature of the DCGS mission can pose challenges to sustaining healthy lifestyle and coping strategies. Previous studies assessing the psychological health among DCGS intel operators identified occupational stress as a chronic issue, often tied to sources of stress including heavy workload, low manning, organizational leadership and management difficulties,

nature of deployed-in-garrison work, and shift work issues [2,3]. Results of these studies point to an elevated rate of emotional exhaustion among intel operators (27%) as compared to that of support personnel (11%), as well as continuously high levels psychological distress rates among intel operators (14-16%) with notably lower rates among non-intel support counterparts (8-9%). Chronic exhaustion and distress can wear down the body and mind and are associated with diseases such as diabetes, high blood pressure, and irritable bowel syndrome and other ailments such as concentration difficulties, irritability, and insomnia [4]. Negative coping strategies to contend with stress, such as excess caffeine, nicotine, and alcohol use, and a deficit in physical fitness activity can further contribute to reduction in overall health.

Since the 2013-2014 USAFSAM aeromedical operational psychology DCGS psychological health study, healthcare providers have been positioned within the operational groups of the 480th ISR Wing to address stress-related issues and concerns, as well as to influence positive change in the aforementioned, less than desirable, health trends. The decision to invest in embedded healthcare resources was a direct outcome of the 2009-2013 USAFSAM occupational health surveys across the DCGS remotely piloted aircraft (RPA) and cyber arenas, frequently referred to as the "remote warrior" community. The composition of the embedded healthcare teams, officially called operational medical elements, includes an operational physician and medical technician, as well as an operational psychologist and mental health technician. These medical professionals collaborate and work in concert with line leadership to address key physical and psychological health concerns and to promote resiliency among their designated remote warrior workforces.

The purpose of this study was to identify more current trends in overall DCGS health behaviors to determine any changes since the 2013-2014 assessment. Additionally, the study revealed self-reported differences among sub-groups of the Total Force (active duty intel operators, active duty non-intel, ANG/Reserves intel, and ANG/Reserves non-intel) in the following areas:

- Demographics and occupational variables
- The frequency of health behaviors regarding the amount of sleep obtained before work and the frequency of engaging in structured physical exercise throughout the week
- The amount, frequency, and increase in consumption of alcohol, tobacco, and caffeine (use of traditional and designer energy drinks) and the reasons for increased consumption
- Medical conditions worsened by current unit assignment and occupational stress
- Healthcare utilization (mental and medical) and increase in healthcare utilization since being assigned to their current duties and the reasons for such increases
- Increases in medication utilization (i.e., prescription and OTC) since being assigned to their current duties and the reasons for such increases

Additional aims of the current study include identifying differences in the above categories:

- Within each group based on shift workers and standard day workers
- Among a subset of shift workers for the four groups
- Specifically within active duty groups since the 2013 study

Recent normative population data have shown differences in alcohol, tobacco, and caffeine consumption patterns for groups of individuals 18-25 versus 26 and older [5].

Additionally, hazardous drinking thresholds are defined separately for males and females [6]. These differences are also of secondary interest in the current study.

Investigating the health behaviors and healthcare utilization trends for DCGS personnel will provide line leadership and the operational medical element embedded care providers with an additional source of information to better understand the health habits and needs for DCGS personnel. This information will aid in the development of force management strategies for optimizing health and performance and may assist embedded medical and mental health providers with understanding the frequency and prevalence of problematic behavioral health habits through the DCGS community.

3.0 METHODS

3.1 Participants

Participants in the current study consisted of 1717 DCGS active duty (AD) intel, 394 AD non-intel, 312 ANG and Reserves (ANG/Res) intel, and 73 ANG/Res non-intel DCGS personnel who completed a comprehensive occupational psychological health questionnaire. The overall personnel numbers for these groups were obtained from USAF operational leadership. This number was then compared with the number of personnel who participated in the study to obtain an overall response rate for each group. The response rate was approximately 33% for the AD population and 12% for the ANG/Res. Frequency tables of duty positions within each group, and additional groupings used within the report (shift workers vs. standard day workers; age 18-25 years vs. 26+ years), are shown in Appendix A. The study has been reviewed and approved by the Air Force Research Laboratory Institutional Review Board.

3.2 Questionnaire

The first part of the survey included demographic items that assessed respondents' gender, age range, marital status, and number of dependents living at home. This section also contained operational items that assessed unit of assignment, duty position, rank range, length of time serving as a DCGS intel operator or non-intel support personnel, average number of hours worked in a typical week, and current work schedule. This section of the questionnaire was designed so that no identifiable personal information was obtained to maintain anonymity for respondents. This was done to encourage genuine self-disclosure in a community where there may be strong cultural stigmas (and concerns for negative career implications) regarding the self-reporting of medical or mental health problems.

The second part of the survey consisted of questions designed to assess sleep and physical exercise health behaviors; alcohol, tobacco, and caffeinated beverage use; medical conditions created or made worse by current unit assignment; medical and mental health support; and prescription and OTC medication use. A list of the items and response options are shown in Appendix B.

3.3 Procedure

Survey participation was encouraged by DCGS line leadership via their USAF e-mail accounts. A mass e-mail invitation to participate informed personnel that participation was voluntary and anonymous. Line leadership invitations to participate included statements that

clarified the purpose of the survey was to gain a better understanding of the health issues and behaviors of DCGS personnel to identify areas to improve health and morale.

The group e-mail invitation to participate had an internet link to the USAFSAM web-based survey. The 480th ISR Wing, ANG, and Reserves had separate links to identical surveys. The introductory script included statements that the study was conducted by independent researchers and participation was voluntary and anonymous. The introductory page also gave the nature, purpose, and instructions of the study and informed participants that operational leadership would not have access to individual responses and results would be presented in a summarized format at the squadron level. It was also clearly communicated to participants that they could withdraw at any time without negative repercussions. The web page also had a list of Wing-specific, ANG-specific, and aeromedical psychologist points of contact if a participant had questions or concerns related to his or her health and well-being. Participants were encouraged to contact their Wing or location point of contact if they were interested in discussing their health, especially if any items on the survey raised personal concerns.

Before participants could begin the comprehensive psychological health survey, they were asked if they understood the nature, purpose, and instructions of the survey and were voluntarily consenting to participate. Those who endorsed "yes" were then allowed to proceed and take the survey. Those who endorsed "no" were not given the survey and were redirected to another web page that instructed them how to contact the independent researchers of the study for additional information. Of the individuals initiating the survey, 59 out of 2464 individuals (2.39%) from the 480th ISR Wing link, 11 out of 372 (2.96%) from the ANG link, and 7 out of 252 (2.78%) from the Reserves link declined participation after reading the informed consent section of the introductory web page for the survey.

In general, it took respondents 25 to 30 minutes to complete the survey. After completing the survey, respondents were instructed on how to obtain the general results of the study and when such information would be available.

3.4 Data Analysis

First, the 480th ISR Wing, ANG, and Reserve datasets were merged to better allow for comparisons among the groups. Then the 480th ISR Wing dataset was examined for ANG and Reserves responses from the 480th ISR Wing dataset, and these responses were added to the ANG/Reserves group. The combined dataset was cleaned by identifying duplicate cases, removing individuals exiting the survey in the demographic and occupational sequence, and removing cases with inconsistent responding (e.g., individuals choosing the middle response option for a majority of items, individuals completing entire survey in 5 minutes or less). ANG and Reserves participants were then reduced to include only those indicating units and locations where DCGS-related duties are performed.

Alcohol consumption thresholds were computed using the AUDIT-C. The AUDIT-C is a three-item alcohol misuse screen that identifies individuals who are hazardous drinkers or may have active alcohol use disorders. Each item is scored on a scale of 0-4, and the total AUDIT-C score is on a scale of 0-12. The thresholds for hazardous drinking are defined as 4 or more for males and 3 or more for females [6]. An additional threshold result is presented, accounting for the removal of individuals who met the threshold based solely on item 1. For example, an individual who drinks one glass of wine four nights a week would meet the overall threshold, but would not meet the secondary threshold. While this individual may have a hazardous drinking habit, it cannot be determined by this screen alone.

Caffeine portions per day were calculated based on the serving size items in the survey. The traditional caffeine portions variable included portions of caffeinated tea, standard brew coffee, espresso-based beverages, and caffeinated soda. The energy drink portions per day variable included portions of energy shots and energy drinks. While the items stipulated both number of portions and portion size, the current study limited the frequencies to include three number of portion ranges: 1-2, 3-4, and 5+ portions. A variable was also created to account for the number of individuals reporting drinking both traditional forms of caffeine and energy drinks.

A complete list of items from the occupational health questionnaire included in the current study is found in Appendix B. In each health behavior item sequence, the first item addresses the presence or absence of consumption or usage, and subsequent items ask for further details of the consumption or usage. Therefore, the total response to items regarding an increase in poor health habits, healthcare utilization, and medication usage is lower than the response to the initial presence or absence item. Reporting the valid percentage for this item would result in an overrepresentation of the individuals reporting an increase; likewise, reporting the percentage using an overall group *n* as the denominator would result in an underrepresentation of the statistic. Therefore, the percentage for the "increase" items was computed using the *n* for the response to the first item in the sequence as the denominator, and these instances are noted in the tables.

3.4.1 Quantitative Analyses. Group frequencies and percentages for the DCGS AD intel, AD non-intel, ANG/Res intel, and ANG/Res non-intel personnel were calculated for items assessing the following:

1. Demographics (gender, age range, marital status, and dependents at home)
2. Occupational variables (rank range, time on station, and hours worked per week)
3. Health behaviors relating to sleep (average number of hours of sleep before work, change in sleep habits) and exercise (average number of days engaged in moderate physical exercise/strength training per week and schedule allows for fitness requirements)
4. Poor health habits (alcohol consumption-frequency, number of drinks per occasion, and AUDIT-C results; tobacco use; and caffeine consumption and portions per day) and increases in poor health habits
5. Medical conditions perceived to be created or worsened by unit assignment or occupational stress
6. Healthcare utilization (mental and medical) and increased healthcare utilization
7. Increased medication utilization (prescription and OTC)

3.4.1.1 Proportion Comparisons. Independent proportions were calculated, applying Tukey's correction for multiple comparison tests for proportions [7]. An SAS macro, COMPROP, was used to calculate the multiple comparisons. The output provides a comparison of all possible combinations of comparisons. In the output, "R" indicates a significant difference between groups and a rejection of the null hypothesis; an "A" indicates no significance difference between groups, based upon the critical value for the number of comparison groups. Independent proportion sample size assumptions were violated in instances where $n<5$. Proportion comparisons were first calculated using the four groups, resulting in six comparisons. The current study was only concerned with the following four comparisons, and only proportion comparisons that meet the sample size requirement of five or more and significant at $p<0.05$ are reported in the tables. The larger proportion of the two proportions is presented first in the table:

- AB. AD intel vs. AD non-intel (*or BA*)
- AC. AD intel vs. ANG/Res intel (*or CA*)
- BD. AD non-intel vs. ANG/Res non-intel (*or DB*)
- CD. ANG/Res intel vs. ANG/Res non-intel (*or DC*)

Next, proportion comparisons were run using eight groups – splitting each of the four mentioned groups into shift workers and standard day workers. While this results in 28 different comparisons, the current study was only concerned with comparisons within each of the four groups and the AD shift workers group vs. the other three shift workers groups. Only proportion comparisons that meet the sample size requirement and are significant at $p<0.05$ are noted in the text of this report for the following comparisons:

Among shift workers:

- AD intel shift workers vs. AD non-intel shift workers
- AD intel shift workers vs. ANG/Res intel shift workers
- AD non-intel shift workers vs. ANG/Res non-intel shift workers
- ANG/Res intel shift workers vs. ANG/Res non-intel shift workers

Within groups:

- AD intel shift workers vs. AD intel standard day workers
- AD non-intel shift workers vs. AD non-intel standard day workers
- ANG/Res intel shift workers vs. ANG/Res intel standard day workers
- ANG/Res non-intel shift workers vs. ANG/Res non-intel standard day workers

Additionally, alcohol, tobacco, and caffeine health behaviors were further broken down into two age groups based on recent normative population data from the 2014 National Survey on Drug Use and Health (NSDUH) showing different patterns emerging for those 18-25 years compared to those 26 years or older (see Appendix C for comparisons split by age ranges [5]). With the different thresholds for AUDIT-C hazardous drinking behavior based on gender (4+ for males and 3+ for females), there are separate tables for males and females for alcohol consumption in the results section as well as in Appendix C.

While the ANG and Reserves participants are combined into Total Force ANG/Res intel and ANG/Res non-intel groups, it is also of interest to show the individual group frequencies and percentages and where differences were found between the groups. These results are shown in Appendix D. Proportion comparisons were calculated using the four groups, resulting in six comparisons. The current study was only concerned with the following four comparisons, and only proportion comparisons that meet the sample size requirement of five or more and significant at $p<0.05$ are reported in the tables in Appendix D. The larger proportion of the two proportions is presented first in the table:

- AB. ANG intel vs. ANG non-intel (*or BA*)
- AC. ANG intel vs. Reserves intel (*or CA*)
- BD. ANG non-intel vs. Reserves non-intel (*or DB*)
- CD. Reserves intel vs. Reserves non-intel (*or DC*)

Additionally, Appendix D has ANG and Reserves group comparisons for shift workers and standard day workers. The following comparisons are listed in the body of Appendix D if they meet the sample size requirement of five or more and are significant at $p<0.05$:

Among shift workers:

- ANG intel shift workers vs. ANG non-intel shift workers
- ANG intel shift workers vs. Reserves intel shift workers
- ANG non-intel shift workers vs. Reserves non-intel shift workers
- Reserves intel shift workers vs. Reserves non-intel shift workers

Within groups:

- ANG intel shift workers vs. ANG intel standard day workers
- ANG non-intel shift workers vs. ANG non-intel standard day workers
- Reserves intel shift workers vs. Reserves intel standard day workers
- Reserves non-intel shift workers vs. Reserves non-intel standard day workers

3.4.1.2 Multinomial Logistic Regressions. Multinomial logistic regressions were performed using the AD intel group as the reference category in comparison to AD non-intel, ANG/Res intel, and ANG/Res non-intel. Reference categories for predictor variables were chosen based on the category with the largest percentage of responses. Regressions with two predictor variable categories had degrees of freedom of 3, and regressions with three predictor variable categories had degrees of freedom of 6, etc., to indicate the number of groupings for predictor category and comparison groups; however, comparisons for ANG/Res non-intel vs. AD intel were not included in the tables because they were not of interest to the study. The groups were required to have $n\geq30$, and the individual categories for each predictor required $n\geq5$ to be included in the logistic regression analysis (this requirement excluded the ANG/Res non-intel group for some analyses). A statistical significance level of $p<0.05$ was established a priori. Results reaching this significance level with confidence intervals (CIs) that do not pass through the value "1" are notated in the tables. Significant results with a value greater than 1 indicate that the category (either AD non-intel or ANG/Res intel) has a greater odds than AD intel for that predictor. In instances of significant odds ratios (ORs) where the predicted category has a value less than 1, the category has lesser odds than the comparison category (AD intel), or in other words, AD intel has greater odds than that category for that predictor. In these instances, the inverse of the OR and 95% CI is noted in the table notes.

For Appendix D, two intelligence categories were of interest for comparisons – ANG intel and Reserves intel. To adequately account for all necessary comparisons, multinomial logistic regressions were run twice, once with ANG intel as the comparison group and once with Reserves non-intel as the comparison group. This allowed for one run with the first category as a comparison group and one run with the last category as a comparison group. Significant ORs were reported for the following comparisons of interest:

- ANG intel vs. ANG non-intel
- ANG intel vs. Reserves intel
- ANG non-intel vs. Reserves non-intel
- Reserves intel vs. Reserves non-intel

3.4.2 Qualitative Analyses. A behavioral science researcher performed qualitative analyses on textual responses to the open-ended, write-in response items from the questionnaire (Appendix B). The semantics of participants' textual responses were analyzed and coded into a list of categories. The frequency of coded responses for each semantic category was computed and the top three to five responses are reported.

4.0 RESULTS

4.1 Demographics

The final dataset of DCGS participants included 1717 AD intel, 394 AD non-intel, 312 ANG/Res intel, and 73 ANG/Res non-intel. Frequencies for demographics and occupational variables for the four groups, and a summary of significant proportion comparisons, are shown in Table 1. A summary of significant findings follows:

A larger proportion of AD intel when compared to AD non-intel reported:

- Female
- Working shift work and rotating shifts every 61 days or more

A larger proportion of AD intel when compared to ANG/Res intel reported:

- Age ranges 18-25, 26-35 years
- Single
- No dependents at home
- Enlisted rank
- 24 months or less in their current duties
- Working shift work and rotating shifts every 61 days or more

A larger proportion of AD *non-intel* when compared to ANG/Res *non-intel* reported:

- Age range 18-25 years
- No dependents at home
- 24 months or less in their current duties

Table 1. DCGS Demographics, Occupational Variables, and Significant Proportion Comparisons

Demographics and Occupational Variables	AD Intel		AD Non-Intel		ANG/Res Intel		ANG/Res Non-Intel		Significant Proportion Comparisons $p<0.05$
	n	%	n	%	n	%	n	%	
Gender									
Male	1221	71.40	316	80.82	218	71.01	49	70.00	BA
Female	489	28.60	75	19.18	89	28.99	21	30.00	--
Age Range (yr)									
18-25	536	31.25	127	32.48	26	8.36	3	4.11	AC; BD
26-35	915	53.35	189	48.34	130	41.80	30	41.10	AC
36+	264	15.39	75	19.18	155	49.84	40	54.79	DB; CA
Marital Status									
Single	708	42.19	167	43.15	86	28.10	22	31.88	AC
Married	970	57.81	220	56.85	220	71.90	47	68.12	--
Dependents at Home									
Yes	696	40.99	145	36.99	177	57.10	43	58.90	DB; CA
No	1002	59.01	247	63.01	133	42.90	30	41.10	--
Rank Range									
Enlisted	1558	90.95	358	91.56	236	76.38	69	94.52	AC
Officer	155	9.05	33	8.44	73	23.62	4	5.48	--
Time on Station (mo)									
≤24	1325	78.45	297	77.14	165	53.92	33	45.83	AC; BD
>24	364	21.55	88	22.86	141	46.08	39	54.17	--
Shift Schedule									
Standard Day	646	38.54	246	63.90	176	57.52	41	58.57	BA; CA
Shift Work	1030	61.46	139	36.10	130	42.48	29	41.43	--
Shift Rotation Frequency (d)									
≤30	59	3.65	3	0.78	14	4.79	2	2.90	*ns*
31-60	114	7.05	9	2.35	19	6.51	1	1.45	*ns*
61+	547	33.81	63	16.45	31	10.62	7	10.14	AB; AC
Fixed Shift	310	19.16	66	17.23	58	19.86	14	20.29	*ns*
N/A	588	36.34	242	63.19	170	58.22	45	65.22	BA; CA
Hours Worked per Week									
30-50	1317	80.75	303	82.56	239	83.86	55	90.16	*ns*
51+	314	19.25	64	17.44	46	16.14	6	9.84	--

A = AD intel; B = AD non-intel; C = ANG/Res intel; D = ANG/Res non-intel; N/A = not applicable; *ns* = not significant.

Additionally, when splitting the groups into shift workers and non-shift workers, the following comparisons were significant *among shift workers*:

- A larger proportion of AD intel shift workers were 18-25 years old (n=390, 37.86%) compared to ANG/Res intel shift workers (n=13, 10.00%). ANG/Res intel shift workers had a larger proportion of individuals 36+ years old (n=54, 41.54%) than AD intel shift workers (n=101, 9.81%).
- A larger proportion of AD intel shift workers did not have dependents at home (n=669, 65.14%) compared to ANG/Res intel shift workers (n=57, 43.85%).
- A larger proportion of AD intel shift workers were enlisted (n=964, 93.68%) compared to ANG/Res intel shift workers (n=105, 80.77%).

- A larger proportion of AD intel shift workers (n=766, 74.44%) reported being in their current duties 24 months or less compared to ANG/Res intel shift workers (n=66, 50.77%).
- A larger proportion of AD non-intel shift workers (n=105, 76.64%) reported being in their current duties 24 months or less compared to ANG/Res non-intel shift workers (n=11, 37.93%).
- A larger proportion of AD intel shift workers reported rotating shifts every 61+ days (n=528, 53.93%) compared to AD non-intel shift workers (n=55, 40.15%) and ANG/Res intel shift workers (n=28, 23.33%).

The following comparisons were significant *within groups*:

- A larger proportion of AD intel shift workers were 18-25 years old (n=390, 37.86%) compared to AD intel working standard days (n=133, 20.62%). AD intel working standard days had a larger proportion of individuals 36+ years old (n=155, 24.03%) compared to AD intel working shift work (n=101, 9.81%).
- A larger proportion of AD intel shift workers were single (n=476, 46.94%) compared to AD intel working standard days (n=214, 33.81%).
- A larger proportion of AD intel shift workers did not have dependents at home (n=669, 65.14%) compared to AD intel working standard days (n=314, 48.83%).
- A larger proportion of AD intel shift workers were enlisted (n=964, 93.68%) when compared to AD intel working standard days (n=559, 86.67%).
- A larger proportion of AD intel working standard days reported being in their current duties 24 months or less (n=547, 84.67%) compared to AD intel shift workers (n=766, 74.44%).

Multinomial logistic regressions with AD intel as the reference group are shown in Table 2. A summary of significant findings follows:

- AD intel had 1.69 times greater odds of being female than AD non-intel.
- When compared to the 26-35 age range, AD intel had 2.93 times greater odds of being in the 18-25 age range than ANG/Res intel.
- When compared to the 26-35 age range, AD non-intel had 1.38 and ANG/Res intel had 4.13 times greater odds of being in the 36+ age range than AD intel.
- AD intel had 1.87 times greater odds of being single than ANG/Res intel.
- ANG/Res intel had 1.92 times greater odds of having dependents at home than AD intel.
- ANG/Res intel had 3.11 times greater odds of being officers than AD intel.
- ANG/Res intel had 3.11 times greater odds of being in their current duties more than 24 months than AD intel.
- AD non-intel had 2.82 and ANG/Res intel had 2.16 times greater odds of working a standard day than working shift work than AD intel. Additionally, AD intel had 3.37 times greater odds of rotating shifts every 61+ days than ANG/Res intel.

Table 2. Regression Results for Demographics, Occupational Variables

Demographic and Occupational Variables	$\chi^2(df)$	p	AD Non-Intel/ AD Intel OR [95% CI]	ANG/Res Intel/ AD Intel OR [95% CI]
Gender				
Male[a]	16.08(3)	0.00		
Female			0.59[b,c] [0.45, 0.78]	1.02 [0.78, 1.33]
Age Range (yr)				
18-25			1.15 [0.89, 1.47]	0.34[b,d] [0.22, 0.53]
26-35[a]	245.56(6)	0.00		
36+			1.38[b] [1.02, 1.86]	4.13[b] [3.15, 5.42]
Marital Status				
Single			1.04 [0.83, 1.30]	0.54[b,e] [0.41, 0.70]
Married[a]	25.67(3)	0.00		
Dependents at Home				
Yes			0.85 [0.67, 1.06]	1.92[b] [1.50, 2.45]
No[a]	40.90(3)	0.00		
Rank Range				
Enlisted[a]	51.69(3)	0.00		
Officer			0.93 [0.63, 1.37]	3.11[b] [2.28, 4.24]
Time in Current Duties (mo)				
≤24[a]	102.61(3)	0.00		
>24			1.08 [0.83, 1.41]	3.11[b] [2.42, 4.01]
Shift Schedule				
Standard Day			2.82[b] [2.24, 3.55]	2.16[b] [1.69, 2.76]
Shift Work[a]	108.20(3)	0.00		
Shift Rotation Frequency (d)				
≤60[a]	189.30(9)	0.00		
61+			1.66 [0.88, 3.15]	0.30[b,f] [0.18, 0.50]
Fixed			3.07[b] [1.61, 5.84]	0.98 [0.62, 1.56]
N/A			5.93[b] [3.24, 10.85]	1.52[b] [1.01, 2.28]
Hours Worked Per Week				
30-50[a]	5.47(3)	0.14		
51+			0.89 [0.66, 1.19]	0.81 [0.58, 1.13]

[a]Indicates comparison category for predictor. The first two categories for shift rotation frequency were combined to meet sample size requirements.
[b]Indicates significant chi-square (p<0.05) and OR.
[c]Inverse OR 1.69 [1.28, 2.22].
[d]Inverse OR 2.93 [1.90, 4.52].
[e]Inverse OR 1.87 [1.43, 2.44].
[f]Inverse OR 3.37 [2.00, 5.66].

4.2 Sleep and Physical Exercise Health Behaviors

Frequencies for sleep and physical exercise health behaviors for the four groups, and a summary of significant proportion comparisons, are shown in Table 3. A summary of significant findings follows:

Table 3. DCGS Sleep and Exercise Health Behaviors and Significant Proportion Comparisons

Sleep and Exercise Variables	AD Intel		AD Non-Intel		ANG/Res Intel		ANG/Res Non-Intel		Significant Proportion Comparisons $p<0.05$
	n	%	n	%	n	%	n	%	
Hours of Sleep Before Work									
≤4	124	9.76	24	9.23	16	7.48	4	8.70	*ns*
5-6	672	52.87	127	48.85	101	47.20	25	54.35	*ns*
7-8	462	36.35	106	40.77	94	43.93	16	34.78	*ns*
9+	13	1.02	3	1.15	3	1.40	1	2.17	--
Feel Adequately Rested for Work									
Yes	645	51.68	153	60.00	129	61.14	30	66.67	*ns*
No	603	48.32	102	40.00	82	38.86	15	33.33	--
Difficulty Commuting to/from Work									
Yes	386	30.56	29	11.33	56	26.29	10	21.74	AB
No	877	69.44	227	88.67	157	73.71	36	78.26	--
Sought RX to Aid in Sleep									
Yes	144	11.31	21	8.08	23	10.75	0	0.00	*ns*
No	1129	88.69	239	91.92	191	89.25	47	100.00	--
Sought OTC to Aid in Sleep									
Yes	366	28.89	56	21.71	45	21.03	13	27.66	*ns*
No	901	71.11	202	78.29	169	78.97	34	72.34	--
If Taking Sleep Medication, Received Timing of Medication Education[a]									
Yes	210	12.23	34	8.63	28	8.97	3	4.11	*ns*
No	246	14.33	43	10.91	36	11.54	10	13.70	*ns*
N/A	792	46.13	178	45.18	149	47.76	34	46.58	*ns*
Aerobic Exercise per Week									
None	58	4.57	12	4.65	17	7.98	3	6.38	*ns*
1-2 times	435	34.31	85	32.95	68	31.92	15	31.91	*ns*
3-4 times	565	44.56	117	45.35	104	48.83	25	53.19	*ns*
5-6 times	176	13.88	34	13.18	2	9.39	3	6.38	*ns*
Daily	34	2.68	10	3.88	4	1.88	1	2.13	--
Strength Training per Week									
None	187	14.78	33	12.74	40	18.78	13	27.66	*ns*
1-2 times	526	41.58	91	35.14	97	45.54	19	40.43	*ns*
3-4 times	393	31.07	85	32.82	58	27.23	12	25.53	*ns*
5-6 times	128	10.12	45	17.37	15	7.04	3	6.38	*ns*
Daily	31	2.45	5	1.93	3	1.41	0	0.00	--
Schedule Allows for Fitness Requirements									
Yes	846	66.61	212	82.17	141	65.89	35	74.47	BA
No / Not Sure	424	33.39	46	17.83	73	34.11	12	25.53	--

A = AD intel; B = AD non-intel; *ns* = not significant; RX = prescription medication.
[a]Group n used as the denominator.

A larger proportion of AD intel when compared to AD non-intel reported:

- Difficulty commuting to or from work
- Their schedule does not allow for fitness requirements

Additionally, when splitting the groups into shift workers and non-shift workers, the following comparisons were significant *among shift workers*:

- A larger proportion of AD intel shift workers (n=287, 37.03%) reported difficulty commuting to or from work compared to AD non-intel shift workers (n = 8, 8.89%).

The following comparisons were significant *within groups*:

- A larger proportion of AD intel shift workers reported difficulty commuting to or from work (n=287, 37.03%) compared to AD intel working standard days (n=97, 20.12%).
- A larger proportion of ANG/Res intel shift workers reported difficulty commuting to or from work (n=34, 36.96%) compared to ANG/Res intel working standard days (n=22, 18.18%).
- A larger proportion of AD intel shift workers reported seeking OTC medication to aid in sleep since being assigned to their current unit (n=254, 32.56%) compared to AD intel working standard days (n=110, 22.82%).
- A larger proportion of AD intel shift workers reported not receiving education on the proper timing of medication (n=176, 22.95%) compared to AD intel working standard days (n=70, 14.74%).
- A larger proportion of AD intel shift workers reported their schedule does not allow for fitness requirements (n=231, 29.58%) compared to AD intel working standard days (n=94, 19.46%).

The sleep sequence of the survey contained open-ended, write-in response items to further clarify sleep issues reported by participants. It is important to note that for each of the write-in items, multiple AD intel individuals reported that a recent change in work schedule from 12- to 8- to 10-hour shifts was a positive change to their sleep patterns and sleep quality. However, for individuals responding "yes" to having difficulties commuting to and/or from work in the past month, many responses stipulated that they have rotating shifts and have more of an issue with commuting when they are on mid-night (mids) or night shifts than when they are on days. Responses ranged from 0 times in the past month to 20 times, with most responses saying multiple times a month, or multiple times a week when on nights. The results of qualitative analyses of participants' textual responses revealed the following most frequently cited responses:

If you answered NO [to feeling adequately rested for work], what do you think would improve your ability to be appropriately rested for your work day/night?

- 8- to 10-hour shifts as opposed to 12-hour shifts
- More consistent or predictable schedule
- More and/or better sleep, getting to bed earlier
- Not being assigned to mid or night shifts, being on day shifts
- Reduced stress at work and/or combined work and home stress

What [RX] medication was prescribed [for sleep problems, including both falling and staying asleep]?

- Ambien
- Atarax
- CPAP [continuous positive airway pressure] machine
- Melatonin

If YES [to seeking OTC medication to aid in sleep], what OTC medication are you using?

- Advil PM
- Benadryl
- Diphenhydramine
- Melatonin
- NyQuil
- Unisom
- ZzzQuil

What, if anything would you recommend to unit leadership as a means of mitigating the negative impacts associated with sleep-related concerns?

- Better rest/work cycles, predictable schedules, and schedule rotations
- Less interruptions of sleep, including phone calls, commander calls, all calls, training, administrative duties
- Proper education, including signs of sleep disorders, proper use of OTC medications, relaxation techniques
- Encouragement from leadership to acknowledge sleep issues and to take proper care of oneself
- Sun synchronous work schedule

Multinomial logistic regressions with AD intel as the reference group are shown in Table 4. A summary of significant findings follows:

- AD intel had 1.40-1.47 times greater odds of not being adequately rested for work when compared to AD non-intel and ANG/Res intel.
- AD intel had 3.45 times greater odds of having difficulty commuting to or from work in the past month when compared to AD non-intel.
- AD intel had 1.47-1.53 times greater odds of seeking OTC to aid in sleep when compared to AD non-intel and ANG/Res intel.
- ANG/Res intel had 1.55 times greater odds of doing no strength training per week when compared to AD intel.
- AD intel had 2.31 times greater odds of reporting their schedule does not allow time to meet fitness requirements when compared to AD non-intel.

Table 4. Regression Results for Sleep and Exercise Health Behaviors

Sleep and Exercise Variables	$\chi^2(df)$	p	AD Non-Intel/ AD Intel OR [95% CI]	ANG/Res Intel/ AD Intel OR [95% CI]
Hours of Sleep Before Work				
4 or less			1.02 [0.64, 1.65]	0.86 [0.49, 1.51]
5-6[a]	6.35(6)	0.39		
7 or more			1.21 [0.92, 1.61]	1.36 [0.99, 1.84]
Feel Adequately Rested for Work				
Yes[a]	13.66(3)	0.00		
No			0.71[b,c] [0.54, 0.94]	0.68[b,d] [0.51, 0.92]
Difficulty Commuting to/from Work				
Yes			0.29[b,e] [0.19, 0.44]	0.81 [0.58, 1.13]
No[a]	46.57(3)	0.00		
Sought RX to Aid in Sleep				
Yes			0.69 [0.43, 1.11]	0.94 [0.59, 1.51]
No[a]	2.51(2)	0.29		
Sought OTC to Aid in Sleep				
Yes			0.68[b,f] [0.50, 0.94]	0.66[b,g] [0.46, 0.93]
No[a]	10.17(3)	0.02		
Received Timing of Medication Education				
Yes			0.72 [0.48, 1.07]	0.71 [0.46, 1.09]
No			0.78 [0.54, 1.12]	0.78 [0.53, 1.15]
N/A[a]	10.29(6)	0.11		
Aerobic Exercise per Week				
None			1.00 [0.52, 1.90]	1.78 [1.00, 3.14]
1-2 times			0.94 [0.71, 1.25]	0.95 [0.69, 1.30]
3+ times[a]	4.43(6)	0.62		
Strength Training per Week				
None			0.72 [0.48, 1.09]	1.55[b] [1.02, 2.36]
1-2 times			0.71 [0.53, 0.95]	1.34 [0.97, 1.85]
3+ times[a]	19.12(6)	0.00		
Schedule Allows for Fitness Requirements				
Yes[a]	28.15(3)	0.00		
No / Not Sure			0.43[b,h] [0.31, 0.61]	1.03 [0.76, 1.40]

[a]Indicates comparison category for predictor.
[b]Indicates significant chi-square (p<0.05) and OR.
[c]Inverse OR = 1.40 [1.07, 1.84].
[d]Inverse OR = 1.47 [1.09, 1.98].
[e]Inverse OR = 3.45 [2.30, 5.16].
[f]Inverse OR = 1.47 [1.06, 2.02].
[g]Inverse OR = 1.53 [1.07, 2.17].
[h]Inverse OR = 2.31 [1.64, 3.24].

4.3 Poor Health Habits (Alcohol, Tobacco, Caffeine Use)

4.3.1 Alcohol Use. Frequencies for alcohol health behaviors for the four groups split by gender, and a summary of significant proportion comparison, are shown in Table 5 for males and Table 6 for females. A summary of significant proportion comparison findings follows:

Males – A larger proportion of AD intel when compared to AD non-intel reported:

- Drinking 2-3 times a week

Females – A larger proportion of ANG/Res intel when compared to AD intel reported:

- Drinking 1-2 drinks per day

Additionally, when splitting the groups into shift workers and non-shift workers, no comparisons were significant at $p<0.05$.

Table 5. Alcohol Health Behaviors and Significant Proportion Comparisons for DCGS Males

Alcohol Variables	AD Intel		AD Non-Intel		ANG/Res Intel		ANG/Res Non-Intel		Significant Proportion Comparisons $p<0.05$
	n	%	n	%	n	%	n	%	
Alcohol Frequency									
Never	148	16.05	39	19.21	33	21.29	5	14.71	*ns*
Monthly or less	331	35.90	88	43.35	50	32.26	11	32.35	*ns*
2-4x a month	270	29.28	58	28.57	46	29.68	10	29.41	*ns*
2-3x a week	135	14.64	16	7.88	22	14.19	3	8.82	AB
4+ x a week	38	4.12	2	0.99	4	2.58	5	14.71	*ns*
Drinks per Day									
0	370	40.48	82	40.59	60	38.96	12	35.29	*ns*
1-2	421	46.06	88	43.56	70	45.45	17	50.00	*ns*
3-4	110	12.04	28	13.86	22	14.29	5	14.71	*ns*
5+	13	1.42	4	1.98	2	1.30	0	0.00	--
6+ Drinks per Occasion									
Never	622	67.98	125	62.19	112	72.26	22	64.71	*ns*
< Monthly	243	26.56	62	30.85	38	24.52	8	23.53	*ns*
Monthly	37	4.04	13	6.47	5	3.23	4	11.76	*ns*
Weekly/Daily	13	1.42	1	0.50	0	0.00	0	0.00	--
AUDIT-C Threshold									
Above	168	18.56	35	17.41	25	16.23	6	17.65	*ns*
Below	737	81.44	166	82.59	129	83.77	28	82.35	--
AUDIT-C Secondary Threshold									
Above	159	17.57	35	17.41	23	14.94	5	14.71	*ns*
Below	746	82.43	166	82.59	131	85.06	29	85.29	--
Alcohol Increase[a]									
Yes	117	12.69	20	9.85	16	10.32	4	11.76	*ns*

A = AD intel; B = AD non-intel; *ns* = not significant.
[a]Group n's for response to alcohol frequency item (males only) used as the denominator.

Table 6. Alcohol Health Behaviors and Significant Proportion Comparisons for DCGS Females

Alcohol Variables	AD Intel		AD Non-Intel		ANG/Res Intel		ANG/Res Non-Intel		Significant Proportion Comparisons $p<0.05$
	n	%	n	%	n	%	n	%	
Alcohol Frequency									
Never	64	18.29	11	19.64	9	15.79	1	8.33	*ns*
Monthly or less	147	42.00	24	42.86	23	40.35	5	41.67	*ns*
2-4x a month	99	28.29	16	28.57	18	31.58	3	25.00	*ns*
2-3x a week	30	8.57	5	8.93	3	5.26	3	25.00	*ns*
4+ x a week	10	2.86	0	0.00	4	7.02	0	0.00	--
Drinks per Day									
0	149	42.94	23	41.07	19	33.93	3	25.00	*ns*
1-2	170	48.99	31	55.36	37	66.07	9	75.00	CA
3-4	23	6.63	2	3.57	0	0.00	0	0.00	--
5+	5	1.44	0	0.00	0	0.00	0	0.00	--
6+ Drinks per Occasion									
Never	279	80.64	49	87.50	53	92.98	11	91.67	CA[a]
< Monthly	57	16.47	7	12.50	3	5.26	1	8.33	--
Monthly	7	2.02	0	0.00	1	1.75	0	0.00	--
Weekly/Daily	3	0.87	0	0.00	0	0.00	0	0.00	--
AUDIT-C Threshold									
Above	75	21.68	10	17.86	8	14.29	3	25.00	*ns*
Below	271	78.32	46	82.14	48	85.71	9	75.00	--
AUDIT-C Secondary Threshold									
Above	55	15.90	6	10.71	2	3.57	1	8.33	AC[a]
Below	291	84.10	50	89.29	54	96.43	11	91.67	--
Alcohol Increase[b]									
Yes	64	18.29	12	21.43	6	10.53	1	8.33	*ns*

A = AD intel; C = ANG/Res intel; *ns* = not significant.
[a]Proportion comparison is significant but violates the n≥5 assumption for independent proportion comparisons.
[b]Group n's for response to alcohol frequency item (females only) used as the denominator.

Multinomial logistic regressions with AD intel as the reference group are shown in Tables 7 and 8. A summary of significant findings follows:

- AD intel *males* had 2.24 times greater odds than AD non-intel males to drink 2-3 times per week and 5.05 times greater odds to drink 4+ drinks times per week.
- AD intel *females* had 3.18 times greater odds than ANG/Res intel females to drink 6+ drinks on occasion.
- AD intel *females* had 5.10 times greater odds than ANG/Res intel females to meet the AUDIT-C secondary threshold.

Table 7. Regression Results for Alcohol Health Behaviors for Males

Alcohol Variables	$\chi^2(df)$	*p*	AD Non-Intel/ AD Intel OR [95% CI]	ANG/Res Intel/ AD Intel OR [95% CI]
Alcohol Frequency				
Never			0.99 [0.65, 1.51]	1.48 [0.91, 2.39]
Monthly or less[a]	26.45(12)	0.01		
2-4 times a month			0.81 [0.56, 1.17]	1.13 [0.73, 1.74]
2-3 times a week			0.45[b,c] [0.25, 0.79]	1.08 [0.63, 1.85]
4+ times a week			0.20[b,d] [0.05, 0.84]	0.70 [0.24, 2.04]
Drinks per Day				
0			1.06 [0.76, 1.48]	0.98 [0.67, 1.42]
1-2[a]	1.60(6)	0.95		
3 or more			1.25 [0.79, 1.96]	1.17 [0.71, 1.95]
6+ Drinks per Occasion				
Never/No[a]	4.38(3)	0.22		
Yes/Any			1.29 [0.94, 1.77]	0.82 [0.56, 1.19]
AUDIT-C Threshold				
Above			0.92 [0.62, 1.38]	0.85 [0.54, 1.35]
Below[a]	0.57(3)	0.90		
AUDIT-C Secondary Threshold				
Above			0.99 [0.66, 1.48]	0.82 [0.51, 1.33]
Below[a]	0.82(3)	0.84		
Alcohol Increase				
Yes			0.64 [0.39, 1.04]	0.75 [0.43, 1.29]
No[a]	4.16(3)	0.24		

[a]Indicates comparison category for predictor.
[b]Indicates significant chi-square ($p<0.05$) and OR.
[c]Inverse OR = 2.24 [1.27, 3.96].
[d]Inverse OR = 5.05 [1.20, 21.35].

The results of qualitative analyses of participants' textual responses to the open-ended, write-in response item revealed the most frequently cited reasons for an increase in alcohol use included:

- Turning of age to legally drink; turning 21 years old
- Occupational and personal stress
- Social events, interactions
- AD intel only – assignment location, culture

Table 8. Regression Results for Alcohol Health Behaviors for Females

Alcohol Variables	$\chi^2(df)$	p	AD Non-Intel/ AD Intel OR [95% CI]	ANG/Res Intel/ AD Intel OR [95% CI]
Alcohol Frequency				
Never			1.05 [0.49, 2.28]	0.90 [0.39, 2.05]
Monthly or less[a]	1.66(6)	0.95		
More than monthly			0.93 [0.49, 1.74]	1.15 [0.62, 2.12]
Drinks per Day				
0			0.93 [0.52, 1.64]	0.68 [0.38, 1.23]
1 or more[a]	3.06(3)	0.38		
6+ Drinks per Occasion				
Never/No[a]	7.90(3)	0.05		
Yes/Any			0.60 [0.26, 1.37]	0.31[b,c] [0.11, 0.90]
AUDIT-C Threshold				
Above			0.79 [0.38, 1.63]	0.60 [0.27, 1.33]
Below[a]	2.13(3)	0.55		
AUDIT-C Secondary Threshold				
Above			0.64 [0.26, 1.55]	0.20[b,d] [0.05, 0.83]
Below[a]	8.74(3)	0.03		
Alcohol Increase				
Yes			1.27 [0.65, 2.47]	0.48 [0.20, 1.15]
No[a]	5.54(3)	0.14		

[a]Indicates comparison category for predictor. Drinks per day response options collapsed to meet sample size requirements.
[b]Indicates significant chi-square ($p<0.05$) and OR.
[c]Inverse OR = 3.18 [1.11, 9.10].
[d]Inverse OR = 5.10 [1.21, 21.55].

4.3.2 Tobacco Use. Frequencies for tobacco health behaviors for the four groups are shown in Table 9. A larger proportion of AD intel when compared to ANG/Res intel reported:

- Increase in tobacco use

Additionally, when splitting the groups into shift workers and non-shift workers, no comparisons were significant at $p<0.05$.

The most frequent responses to the open-ended question of "how frequently do you use tobacco/nicotine products" were as follows: cigarettes – ranged from one pack of cigarettes per day to a few cigarettes a week; cigars – ranged from one a week to a few a year. Responses indicated a shift from using traditional smoking tobacco to e-cigarettes for younger participants.

Table 9. DCGS Tobacco Health Behaviors and Significant Proportion Comparisons

Tobacco Variables	AD Intel		AD Non-Intel		ANG/Res Intel		ANG/Res Non-Intel		Significant Proportion Comparisons $p<0.05$
	n	%	n	%	n	%	n	%	
Any Current Use[a]									
Yes	203	15.83	46	17.56	22	10.19	2	4.26	BD[b]
No	1079	84.17	216	82.44	194	89.81	45	95.74	--
Types of Tobacco Use									
Smoking Tobacco[a]	126	9.83	28	10.69	15	6.94	2	4.26	*ns*
Smokeless Tobacco[a]	54	4.21	12	4.58	4	1.85	0	0.00	*ns*
Nicotine Alternatives[a]	67	5.23	18	6.87	6	2.78	0	0.00	*ns*
Any Tobacco Increase[a]									
Yes	99	7.72	15	5.73	6	2.78	0	0.00	AC

A = AD intel; B = AD non-intel; C = ANG/Res intel; D = ANG/Res non-intel; *ns* = not significant.
[a]Group n's in response to tobacco current use item used as the denominator. Smoking tobacco defined as cigarettes, cigars, and tobacco pipes. Smokeless tobacco defined as chew, dip, and snuff. Nicotine alternatives defined as e-cigarettes and nicotine gum.
[b]Proportion comparison is significant but violates the n≥5 assumption for independent proportion comparisons.

Multinomial logistic regressions with AD intel as the reference group are shown in Table 10. A summary of significant findings follows:

- AD intel had 1.66 times greater odds than ANG/Res intel to endorse any current use of tobacco products.
- AD intel had 2.06 times greater odds than ANG/Res intel to endorse an increase in tobacco use.

Table 10. Regression Results for Tobacco Health Behaviors

Tobacco Variables	$\chi^2(df)$	p	AD Non-Intel/ AD Intel OR [95% CI]	ANG/Res Intel/ AD Intel OR [95% CI]
Any Current Use				
Yes			1.13 [0.80, 1.61]	0.60[a,b] [0.38, 0.96]
No[c]	6.10(2)	0.05		
Types of Tobacco Use				
Smoking Tobacco	2.87(2)	0.24	0.97 [0.63, 1.48]	0.64 [0.37, 1.11]
Smokeless Tobacco	4.03(2)	0.13	0.97 [0.51, 1.83]	0.40 [0.14, 1.11]
Nicotine Alternatives	4.29(2)	0.12	1.18 [0.69, 2.01]	0.48 [0.21, 1.12]
Tobacco Increase				
Yes			0.65 [0.37, 1.13]	0.49[a,d] [0.24, 0.97]
No[c]	6.72(2)	0.04		

[a]Indicates significant chi-square ($p<0.05$) and OR.
[b]Inverse OR = 1.66 [1.04, 2.64].
[c]Indicates comparison category for predictor. ANG/Res non-intel was not used as a predictor category because of low n's. Comparison category for smoking tobacco, smokeless tobacco, and nicotine alternatives is *no response/endorsement* to the item on the checklist.
[d]Inverse OR = 2.06 [1.03, 4.12].

The results of qualitative analyses of participants' textual responses to the open-ended, write-in response item revealed the most frequently cited reasons for an increase in tobacco use included:

- Reason to take a break from work, step outside the building
- Work stress, administrative workload
- Social smoking

4.3.3 Caffeine/Energy Supplement Consumption. Frequencies for caffeinated health behaviors for the four groups are shown in Table 11. A summary of significant proportion comparison findings follows, with a higher proportion of AD intel:

- Reporting consuming caffeinated beverages than AD non-intel
- Drinking caffeinated tea and standard coffee than AD non-intel
- Drinking energy drinks in general, and drinking 1-2 energy drinks when compared to ANG/Res intel
- Drinking both traditional and energy drinks when compared to ANG/Res intel
- Reporting an increase in caffeine use when compared to AD non-intel and ANG/Res intel

Table 11. DCGS Caffeine Health Behaviors and Significant Proportion Comparisons

Caffeine Variables	AD Intel		AD Non-Intel		ANG/Res Intel		ANG/Res Non-Intel		Significant Proportion Comparisons $p<0.05$
	n	%	n	%	n	%	n	%	
Caffeine Consumption									
Yes	1019	79.24	187	71.65	174	80.56	37	78.72	AB
No	267	20.76	74	28.35	42	19.44	10	21.28	--
Consumption Types									
Caffeinated Tea	454	35.30	64	24.52	76	35.19	16	34.04	AB
Standard Coffee	740	57.54	117	44.83	128	59.26	27	57.45	AB
Caffeinated Soda	484	37.64	106	40.61	85	39.35	24	51.06	*ns*
Espresso Based	332	25.82	64	24.52	63	29.17	7	14.89	*ns*
Energy Drink	439	34.14	87	33.33	48	22.22	16	34.04	AC
Caffeine or Energy Supplements									
Yes	84	6.53	13	4.98	15	6.94	2	4.26	*ns*
Traditional Caffeine Portions Per Day									
1-2	393	30.56	70	26.82	63	29.17	14	29.79	*ns*
3-4	325	25.27	56	21.46	67	31.02	11	23.40	*ns*
5+	250	19.44	45	17.24	37	17.13	12	25.53	*ns*
Energy Drink Portions Per Day									
1-2	338	26.28	59	22.61	35	16.20	10	21.28	AC
3-4	51	3.97	13	4.98	6	2.78	2	4.26	*ns*
5+	22	1.71	7	2.68	1	0.46	2	4.26	*ns*
Consume Traditional and Energy Drinks									
Yes	377	29.32	71	27.20	41	18.98	14	29.79	AC; DC
Caffeine Increase									
Yes	447	34.76	46	17.62	54	25.00	8	17.02	AB; AC

Note: Group n's in response to caffeine consumption item used as the denominator for all items in table. A = AD intel; B = AD non-intel; C = ANG/Res intel; D = ANG/Res non-intel; *ns* = not significant.

Additionally, when splitting the groups into shift workers and non-shift workers, the following comparisons were significant *among shift workers*:

- A larger proportion of AD intel shift workers (n=330, 41.56%) reported an increase in caffeine consumption compared to AD non-intel shift workers (n=17, 18.48%).

The following comparisons were significant *within groups*:

- A larger proportion of AD intel shift workers (n=330, 41.56%) reported an increase in caffeine consumption compared to AD intel working standard days (n=113, 23.25%).
- A larger proportion of AD intel shift workers (n=300, 37.78%) reported consuming energy drinks when compared to AD intel working standard days (n=136, 27.98%).

Multinomial logistic regressions with AD intel as the reference group are shown in Table 12. A summary of significant findings follows:

- AD non-intel had 1.44 times greater odds than AD intel to endorse caffeinated soda consumption.
- AD intel had 1.51 times greater odds than AD non-intel to endorse any caffeinated consumption and 1.60 times greater odds to endorse coffee consumption.
- AD intel had 1.98 times greater odds than ANG/Res intel to endorse energy drink consumption.
- AD intel had 1.83 times greater odds than ANG/Res intel to endorse consuming both traditional and energy drinks.
- AD intel had 2.66 times greater odds than AD non-intel and 1.68 times greater odds than ANG/Res intel to endorse an increase in caffeine consumption.

The results of qualitative analyses of participants' textual responses to the open-ended, write-in response item revealed the most frequently cited reasons for an increase in caffeine use included:

- Long work hours and high workload
- Shift work (mids or nights) in general, or changing from one shift to another shift
- Sleep issues

Table 12. Regression Results for Caffeine Health Behaviors

Caffeine Variables	$\chi^2(df)$	p	AD Non-Intel / AD Intel OR [95% CI]	ANG/Res Intel/ AD Intel OR [95% CI]
Any Current Use				
Yes[a]	7.71(3)	0.05		
No			0.66[b,c] [0.49, 0.90]	1.09 [0.76, 1.56]
Types of Caffeine				
Caffeinated Tea	7.21(3)	0.07	0.65 [0.47, 1.00]	0.96 [0.69, 1.33]
Standard Coffee	8.23(3)	0.04	0.62[b,d] [0.45, 0.86]	1.03 [0.72, 1.48]
Caffeinated Soda	8.98(3)	0.03	1.44[b] [1.05, 1.98]	1.07 [0.77, 1.47]
Espresso Based	4.75(3)	0.19	1.08 [0.77, 1.49]	1.18 [0.85, 1.66]
Energy Drink	17.29(3)	0.00	1.14 [0.84, 1.56]	0.51[b,e] [0.35, 0.72]
Caffeine or Energy Supplements				
Yes	0.45(2)	0.80	0.83 [0.45, 1.52]	1.06 [0.59, 1.88]
Traditional Caffeine Portions Per Day				
1-2[a]	3.92(6)	0.69		
3-4			0.97 [0.66, 1.42]	1.29 [0.89, 1.87]
5+			1.01 [0.67, 1.52]	0.92 [0.60, 1.43]
Energy Drink Portions Per Day				
1-2[a]	2.46(2)	0.29		
3+			1.57 [0.89, 2.77]	0.93 [0.40, 2.17]
Consume Traditional and Energy Drinks				
Yes	14.66(3)	0.00	0.76 [0.57, 1.02]	0.55[b,f] [0.39, 0.78]
Caffeine Increase				
Yes			0.38[b,g] [0.27, 0.52]	0.60[b,h] [0.44, 0.81]
No[a]	54.08(3)	0.00		

[a]Indicates comparison category for predictor. Comparison category for types of caffeine categories and consume traditional and energy drinks is *no.*
[b]Indicates significant chi-square (p<0.05) and OR.
[c]Inverse OR = 1.51 [1.12, 2.04].
[d]Inverse OR = 1.60 [1.16, 2.22].
[e]Inverse OR = 1.98 [1.39, 2.83].
[f]Inverse OR = 1.83 [1.29, 2.58].
[g]Inverse OR = 2.66 [1.92, 3.69].
[h]Inverse OR = 1.68 [1.23, 2.30].

4.4 Medical Conditions Created by or Made Worse by Current Duties

Participants were asked to select from a list all medical conditions or symptoms believed to be caused or worsened by their current duties or occupational stress. In addition, an *other* category was provided for open-ended text responses. Open responses were incorporated into existing categories, when applicable. Some of the survey categories were then combined into larger categories for analysis (see Appendix B for further clarification). The number and group proportions for the five most common endorsements, with a summary of the significant comparisons among group proportions, are shown in Table 13. Anxiety and depression remained as independent categories; however, we also note the number of individuals who reported both categories.

Table 13. Most Frequency Cited Self-Reported Conditions Perceived to be Created or Worsened by Their Current Duties or Occupational Stress and Significant Proportion Comparisons

Medical Conditions	AD Intel		AD Non-Intel		ANG/Res Intel		ANG/Res Non-Intel		Significant Proportion Comparisons $p<0.05$
	n	%	n	%	n	%	n	%	
Headaches, eye strain/vision problems	644	37.33	83	21.07	86	27.56	14	19.18	AB; AC
Musculoskeletal injury/pain (e.g., back, neck, joint pain)	515	29.99	57	14.47	67	21.47	8	10.96	AB; AC
Sleep problems (e.g., insufficient sleep)	428	24.93	43	10.91	53	16.99	10	13.70	AB; AC
Anxiety	233	13.57	30	7.61	28	8.97	6	8.22	AB
Depression	181	10.54	20	5.08	12	3.85	4	5.48	AC; AB
Anxiety and depression	118	6.87	14	3.55	8	2.56	3	4.11	AC; AB

Note: Group n's used as the denominator. A = AD intel; B = AD non-intel; C = ANG/Res intel.

A larger proportion of AD intel when compared to AD non-intel and ANG/Res intel reported:

- Headaches, eye strain/vision problems
- Musculoskeletal injury/pain
- Sleep problems
- Anxiety (AD non-intel only)
- Depression

Additionally, when splitting the groups into shift workers and non-shift workers, the following comparisons were significant *among shift workers*:

- A higher proportion of AD intel shift workers (n=423, 41.07%) reported headaches and/or eye strain/vision problems when compared to AD non-intel shift workers (n=31, 22.30%).
- A higher proportion of AD intel shift workers (n=329, 31.94%) reported musculoskeletal injury/pain when compared to AD non-intel shift workers (n=21, 15.11%).
- A higher proportion of AD intel shift workers (n=325, 31.55%) reported sleep issues when compared to AD non-intel shift workers (n=17, 12.23%).

The following differences were significant *within groups*:

- A higher proportion of AD intel shift workers (n=423, 41.07%) reported headaches and/or eye strain/vision problems when compared to AD intel working standard days (n=216, 33.44%).
- A higher proportion of AD intel shift workers (n=325, 31.55%) reported sleep issues when compared to AD intel working standard days (n=100, 15.48%).
- A higher proportion of ANG/Res intel shift workers (n=34, 26.15%) reported sleep issues when compared to ANG/Res intel working standard days (n=19, 10.80%).
- A higher proportion of AD intel shift workers (n=130, 12.62%) reported depression when compared to AD intel working standard days (n=50, 7.74%).

The results of qualitative analyses of participants' responses to the open-ended, write-in response item "What actions are needed to improve your medical care?" revealed that the most common responses included:

- Greater accessibility of medical services
- Better quality of medical services
- Ergonomic work stations

Responses reflected a concern with continuity of medical care, availability of medical appointments and length of time it takes to be seen by a medical care provider, and the perceived lack of manning for doctors. Concerns regarding work stations include better chairs, standing desks, ability to get up and stretch, and aids to lessen computer screen glare.

4.5 Healthcare Utilization Since Current Unit Assignment

4.5.1 Mental Health Services Utilization. Frequencies for availability of mental health services, seeking assistance from a local mental or medical facility, and increase in mental health services utilization for the four groups are shown in Table 14. A summary of significant proportion comparison findings follows, with a higher proportion of AD intel reporting:

- Not having mental health services consistently available compared to AD non-intel

Additionally, when splitting the groups into shift workers and non-shift workers, no comparisons were significant *among shift workers*. The following comparisons were significant *within groups*:

- A higher number of AD intel shift workers (n=103, 12.83%) reported not having mental health services consistently available or accessible when compared to AD intel working standard days (n=8, 1.60%).

After participants were asked if they sought assistance from embedded operational health personnel, they were asked what type of embedded provider they saw. There were no responses from ANG/Res participants. The most common types of embedded providers that AD participants saw were:

- Military operational psychologist and/or mental health technician (AD intel n=98, 5.71%; AD non-intel n=18, 4.57%)
- Military medical provider and/or technician (AD intel n=48, 2.80%; AD non-intel n=13, 3.30%)
- Intel only – Employee Assistance Services (AD intel n=13, 0.76%)

Table 14. DCGS Mental Health and Medical Utilization and Significant Proportion Comparisons

Healthcare Utilization Variables	AD Intel		AD Non-Intel		ANG/Res Intel		ANG/Res Non-Intel		Significant Proportion Comparisons
	n	%	n	%	n	%	n	%	
Mental Health Services Consistently Available									
Yes	1057	80.69	247	90.48	174	80.18	43	89.58	--
No/DK	253	19.31	26	9.52	43	19.82	5	10.42	AB
Sought Assistance from MTF or Local Medical/Mental Health Clinic									
Yes	417	31.69	79	28.83	58	26.61	16	33.33	*ns*
No	899	68.31	195	71.17	160	73.39	32	66.67	--
Mental Health Services Increase[a]									
Yes	144	10.97	29	10.66	16	7.41	3	6.25	*ns*
Sought Assistance from Embedded Operational Health Personnel/Team									
Yes	155	14.13	32	13.97	8	8.16	4	23.53	*ns*
No	942	85.87	197	86.03	90	91.84	13	76.47	--
Medical Services Increase[b]									
Yes	275	21.70	51	19.84	37	17.70	2	4.35	*ns*
Unreported Injury or Illness									
Yes	136	10.79	14	5.43	16	7.69	3	6.52	AB
No	1125	89.21	244	94.57	192	92.31	43	93.48	--

A = AD intel; B = AD non-intel; DK = "I Don't know" response; MTF = medical treatment facility; *ns* = not significant.
[a]Denominator based on response to "has use of mental health support services changed" item; AD intel = 1313, AD non-intel = 272, ANG/Res intel = 216, ANG/Res non-intel = 48.
[b]Denominator based on response to "has use of medical services changed" item; AD intel = 1267, AD non-intel = 257, ANG/Res intel = 209, ANG/Res non-intel = 46.

Multinomial logistic regressions with AD intel as the reference group are shown in Table 15. A summary of significant findings follows:

- AD intel had 2.27 times greater odds than AD non-intel to endorse that mental health services were not consistently available.

Table 15. Regression Results for Mental Health and Medical Utilization

Health Services Utilization Variables	$\chi^2(df)$	*p*	AD Non-Intel/ AD Intel OR [95% CI]	ANG/Res Intel/ AD Intel OR [95% CI]
Mental Health Services Consistently Available				
Yes[a]	19.49(3)	0.00		
No			0.44[b,c] [0.29, 0.67]	1.03 [0.72, 1.48]
Sought Assistance from MTF or Local Medical/Mental Health Clinic				
Yes			0.87 [0.66, 1.16]	0.78 [0.57, 1.08]
No[a]	2.97(3)	0.40		
Mental Health Services Increase				
Yes			0.87 [0.57, 1.31]	0.59 [0.35, 1.00]
No[a]	4.40(2)	0.11		
Sought Assistance from Embedded Operational Health Personnel/Team				
Yes			0.87 [0.66, 1.16]	0.78 [0.57, 1.08]
No[a]	2.82(2)	0.25		
Medical Services Increase				
Yes			0.78 [0.57, 1.08]	0.71 [0.49, 1.02]
No[a]	5.30(2)	0.07		
Unreported Injury or Illness				
Yes			0.48[b,d] [0.27, 0.84]	0.69 [0.40, 1.18]
No[a]	9.50(3)	0.02		

[a]Indicates comparison category for predictor.
[b]Indicates significant chi-square ($p<0.05$) and OR.
[c]Inverse OR = 2.27 [1.48, 3.48].
[d]Inverse OR = 2.11 [1.19, 3.72].

The results of qualitative analyses of participants' responses to the open-ended, write-in response item revealed the most frequently cited reasons for an increase in mental healthcare utilization included:

- Work stress
- Felt need to talk with someone about specific events (work or personal)
- Family or personal issues

4.5.2 Medical Health Services Utilization. Frequencies for increased medical health services utilization and unreported injury or illness are shown in Table 14. A summary of significant proportion comparison findings follows, with a higher proportion of AD intel reporting:

- Having an unreported injury or illness compared to AD non-intel

Additionally, when splitting the groups into those who work shift work and those who work standard days, no comparisons were significant at $p<0.05$.

Multinomial logistic regressions with AD intel as the reference group are shown in Table 15. A summary of significant findings follows:

- AD intel had 2.11 times greater odds than AD non-intel to endorse an unreported injury or illness.

The results of qualitative analyses of participants' responses to the open-ended, write-in response item revealed the most frequently cited reasons for an increase in medical healthcare utilization included:

- Pain management (age related or in general)
- Injury or illness
- Sleep issues (in general and related to stress)

4.6 Changes in Prescription and OTC Medication Use

4.6.1 Prescription Medication Use. Frequencies for increase in prescription medication use for the four groups are shown in Table 16. Proportion comparisons among groups were not significant at $p<0.05$. Additionally, when splitting the groups into those who work shift work and those who work standard days, no comparisons were significant at $p<0.05$. Multinomial logistic regressions with AD intel as the reference group are shown in Table 17; results were not significant.

The results of qualitative analyses of participants' textual responses to the open-ended, write-in response item revealed the most frequently cited reasons for an increase in prescription medication usage included:

- Allergies
- Sleep issues
- Pain management (including headaches and muscle pain)
- Occupational stress

Table 16. DCGS Medication Use and Significant Proportion Comparisons

Medication Use Variables	AD Intel		AD Non-Intel		ANG/Res Intel		ANG/Res Non-Intel		Significant Proportion Comparisons
	n	%	n	%	n	%	n	%	
Prescription Use Increase									
Yes	221	17.43	45	17.51	29	13.74	5	11.11	*ns*
OTC Use Increase									
Yes	211	16.67	24	9.30	21	10.00	5	10.87	AB; AC

Note: Group denominators based on response to prescription use change: AD intel = 1268; AD non-intel = 257; ANG/Res intel = 211; and ANG/Res non-intel = 45; and OTC use change: AD intel = 1266; AD non-intel = 258; ANG/Res intel = 210; and ANG/Res non-intel = 46. A = AD intel; B = AD non-intel; C = ANG/Res intel; *ns* = not significant.

4.6.2 OTC Medication Use. Frequencies for increase in OTC medication use for the four groups are shown in Table 16. A summary of significant proportion comparison findings follows, with a higher proportion of AD intel reporting:

- An increase in OTC medication use compared to AD non-intel and ANG/Res intel

Additionally, when splitting the groups into shift workers and non-shift workers, no comparisons were significant *within groups*. The following comparisons were significant *among shift workers*:

- A higher number of AD intel shift workers (n=145, 18.89%) reported an increase in OTC medication use when compared to AD non-intel shift workers (n=6, 6.38%).

Multinomial logistic regressions with AD intel as the reference group are shown in Table 17. A summary of significant findings follows:

- AD intel had 2.16 times greater odds than AD non-intel and 1.94 times greater odds than ANG/Res intel to endorse an increase in OTC medication use.

Table 17. Regression Results for Prescription/OTC Medication Use Increase

Medication Variables	$\chi^2(df)$	*p*	AD Non-Intel/ AD Intel OR [95% CI]	ANG/Res Intel/ AD Intel OR [95% CI]
Prescription Use Increase				
Yes			0.87 [0.62, 1.23]	0.69 [0.46, 1.04]
No[a]	5.79(3)	0.12		
OTC Use Increase				
Yes			0.46[b,c] [0.30, 0.72]	0.52[b,d] [0.32, 0.82]
No[a]	21.51(3)	0.00		

[a]Indicates comparison category for predictor.
[b]Indicates significant chi-square ($p<0.05$) and OR.
[c]Inverse OR = 2.16 [1.39, 3.34].
[d]Inverse OR = 1.94 [1.22, 3.09].

The results of qualitative analyses of participants' textual responses to the open-ended, write-in response revealed most frequently cited reasons for an increase in OTC medication usage included:

- Allergies
- Sleep issues
- Pain management (including headaches and muscle pain)

5.0 DISCUSSION

The current study represents an anonymous and voluntary survey assessment of health behaviors within the USAF DCGS population. Expanded to include the ANG and Reserve components, this follow-up occupational health survey examines the same AD operational groups that had been previously assessed in 2013 [1]. It documents the sensitive, high-demand nature of the DCGS intelligence mission, revealing proportionally higher than expected levels of distress among DCGS intelligence operators across the Total Force as compared to co-located support counterparts [2,3,8]. Operational stressors, such as high workload, low manning, organizational conflict, interpersonal conflict, and shift work, are once again self-reported by the DCGS population [2,3]. The current and previous (2014) health behavior surveys represent comprehensive efforts to understand an array of general health habits, such as how DCGS airmen cope with sleep loss and other stressors associated with sustaining 24/7, deployed-in-garrison missions. Between group comparisons looking at similarities and differences between intelligence operators and support personnel, both within and across the AD and ANG/Res components, offer insights into the prevailing health dynamics of the DCGS community. Where possible, data points from the general U.S. civilian population offer counterpoints to findings from this specialized military population.

5.1 Demographics

Overall, the total sample DCGS participants in this study included 1717 AD intel, 394 AD non-intel, 312 ANG/Res intel, and 73 ANG/Res non-intel. The sample in the current study is more robust and includes Total Force intel operators and non-intel personnel when compared to the 2014 report of health behaviors (1091 intelligence operators and 447 support personnel) in the DCGS community [1]. The current study is similar to the 2014 study in terms of gender proportions, hovering around 70% male and 30% female, for both sets of data. There was a greater proportion of AD intel working shift work and rotating shifts every 61 days (or more) when compared to AD non-intel in this study. The 2014 data had similar findings, although shift work was defined slightly differently, with shift rotation frequency described as either less than 2 weeks, every 30 days, or four times a year. Both health behavior survey samples of the DCGS community can be characterized as young, with 81.28% of the 2014 sample of AD intel under 34 years old and 84.60% of the AD intel in the current sample under 35 years old. The main differences in demographics emerged from including ANG/Res DCGS intel and non-intel in the current study. Between group differences emerged when comparing AD intel to ANG/Res intel, with a larger proportion of AD intel who reported being under 35 years old, single with no dependents at home, enlisted rank, working 24 months or less in current duties, working shift work and rotating shifts every 61 days or more as compared to their ANG/Res counterparts. Additionally, a larger proportion of AD non-intel personnel, when compared to ANG/Res non-

intel, are younger (under 25 years old), with no dependents at home and in their current duties for 24 months or less.

The proportion of AD intel working standard days versus shift work did not change significantly from 2014 (38.59% and 61.41% respectively) to 2016 (38.54% and 61.46% respectively). Similarly, 2014 data described AD non-intel working standard days or shift work at 59.96% and 40.04% respectively, and the current study found that non-intel report 63.90% and 36.10% respectively. Within group differences of shift worker groups were not analyzed in the 2014 health screening as they are in the current study. It is important to note, however, that significant findings from the 2014 health behaviors study and 2016 study, with regard to the main sources of occupational stress within the DCGS community, identified shift work as a main contributing variable influencing health behaviors, and informed this study's inclusion of between group analysis for shift workers [1,8]. These between group differences among shift workers will be discussed in further detail in relation to sleep issues and substance use behaviors.

As a note, DCGS senior leadership report that based on recommendations from previous USAFSAM occupational health studies, which suggested more manageable work hours for this high-demand, high-stress community, a shift schedule modification that shortened shift duration was initiated just prior to the conduct of this survey [1,3]. The proportion of DCGS AD intel who reported working 30-50 hours per week increased from 69.58% (2014) to 80.75% (current study), and the proportion who reported working 51 hours or more per week decreased from 30.42% (2014) to 19.25% (current study). The proportions of hours reportedly worked per week of AD non-Intel did not change significantly from 2014 to the current study, staying around 82.56% working 30-50 hours per week and 17.44% working 51 or more hours per week. Follow-up research into how reducing the number of hours worked per shift affects facets of occupational burnout in the DCGS community will be necessary to gauge the efficacy of such leadership interventions.

5.2 Sleep and Sleep-Related Behaviors

The number of hours of sleep obtained prior to work, as reported in this study, remains similar to results from the 2014 DCGS health behaviors screening, with a majority of DCGS AD Intel, AD non-Intel, ANG/Res Intel, and ANG/Res non-Intel falling short of national recommendations for sleep. The National Sleep Foundation and the American Academy of Sleep Medicine recommend that the average healthy adult requires 7-9 hours of sleep for optimal functioning [9,10]. According to the most recent Gallup statistics, 42% of U.S. adults are typically getting less than 7 hours of sleep [11]. For U.S. adults ages 18 to 44, an age range similar to the current DCGS sample, 41-45% report obtaining less than 7 hours of sleep a night [11]. The DCGS community sample in this study reported obtaining less than 7 hours of sleep prior to work at a concerning rate, with 54-63% of respondents indicating they sleep 6 hours or less prior to a typical work shift, a notably higher rate than that of the U.S population. This finding is particularly significant for the DCGS community, given that the National Sleep Foundation states that less than 6 hours of sleep is contraindicated for adults ages 18-64 [9].

Sleep deprivation, defined as an established impairment in functioning [12], was not assessed in this study; however DCGS AD intel operators did report significantly more (30.56%) difficulty commuting to and from work as a result of less sleep than their support counterparts (11.33%). The high-demand, high-stress nature of the job for DCGS intelligence workers seems to contribute to the elevated fatigued beyond what might be expected from working shift work alone, with 37.03% of AD intel shift workers compared to only 8.89% of AD non-intel shift workers having trouble driving to and from work. The etiology of sleep problems has been

linked to the post-deployment period [13], and the "deployed-in-garrison" nature of the DCGS intelligence operator position may significantly contribute to their increased rates of poor sleep quality. Troxel and colleagues [13] adapted Spielman's [14,15] classic model of insomnia to service members. In their conceptual model, precipitating factors, or conditions that occur *before* the onset of sleep problems, included shift work/irregular work schedules. Perpetuating factors or conditions that exacerbate a sleep problem *after* it has started included reintegration challenges (i.e., juggling multiple family roles), which is a continuously salient issue for this deployed-in-garrison population who predominantly work in shifts. These intelligence operators may be more susceptible to insomnia and complications of insomnia due to unique characteristics of their job.

When comparing shift workers to those who worked a standard duty day, a greater proportion of ANG/Res intel shift workers (36.96%) endorsed difficulty driving to and from work as compared to their counterparts working standard days (18.18% ANG/Res intel working standard days). AD intel shift workers (32.56%) were also more likely than AD intel working standard days (22.82%) to have sought OTC medication to aid sleep. These differences found between shift workers and standard day workers appear to highlight differences in sleep quality rather than sleep quantity, given that there were no reported differences in the amount of sleep prior to work between all four groups. Prior research on the impact of shift work on sleep has established that disrupted sleep patterns, diminished sleep quality, and fatigue are strongly linked to shift work [16-22]. Both AD intel shift workers and ANG/Res intel shift workers endorsed proportionately higher sleep-related consequences and compensatory behaviors than their counterparts working standard day shifts. In a study with a closely related sample, increased fatigue in RPA operators was found to significantly contribute to a higher rate of destroyed RPA aircraft compared to manned aircraft with similar mission types [20]. Although the DCGS intelligence operators in this study are not working exclusively with RPA aircraft, they do perform highly critical exploitation of intelligence data and technical information in "real time" for national leaders, combatant commanders, and combat forces. Decreased attention and concentration and decreased work effectiveness that result from sleep-related factors may affect the efficacy and efficiency of the data DCGS intelligence operators provide to leadership and combat crew.

Research on the use of OTC sleep aid medication within the general population, or specifically within the military environment, is sparse. According to a study examining adult students of a similar age to AD DCGS personnel, 11.4% of women and 6.4% of men in the adult student study reported using OTC medications to alleviate sleep issues [23]. Despite probable differences in work schedule between the adult student group and the DCGS sample, the proportion of adult student OTC sleep aid utilization is notably lower than that of AD intel shift workers and AD intel standard day workers (32.56% and 22.82%, respectively). This further suggests significant sleep concerns within the DCGS population and the risk for sleep-related impairment in functioning.

In general, medical providers and sleep specialists discourage long-term use of sleep medication, both OTC and prescription, due to tolerance and dependency (physiological and psychological) concerns. Holistically, these data seem to delineate a trend toward sleep-related problems and compensatory behaviors in the DCGS population. The use of sleep aids, less than adequate amounts of sleep, and self-reported fatigue (trouble driving to and from work as a result of insufficient sleep) put DCGS members at increased risk for accidents and illnesses. Longitudinal study of these data will reveal sleep trends and consequences in this community.

Echoing findings from 2014, the sleep data found in this sample of DCGS suggest that impactful changes that line leadership can make are as follows: 1) to continue to optimize work hours and shift work schedules and 2) to educate and model effective sleep hygiene habits to

optimize recovery following shifts. Shift schedule and associated sleep issues were found to be a significant source of stress for 23.48% of AD intel respondents in research of sources of stress within the DCGS community [8]. As mentioned in the previous health assessment, optimizing work/rest cycles and shift rotation schedules is necessary to minimize transition periods from one cycle to another and to allow operators to fully adjust to a shift before requiring another change.

Many airmen in this sample are in a vulnerable time period of their lives (i.e., between 18-35 years old) where they engage in many behaviors that are antagonistic to obtaining high-quality sleep or adequate sleep duration. Airmen at this age often utilize caffeine or energy beverages, OTC medications, and alcohol to self-regulate their work-rest cycle, unaware that although seemingly efficacious in the short term, these substances exacerbate or perpetuate sleep difficulties in the long run. Also, from a developmental perspective, airmen are likely to have variable eating, social activity, and sleep patterns, rendering them more vulnerable to insomnia. They are likely to juggle new responsibilities particular to their developmental stage in life, such as starting a family, working on college coursework on a part-time basis, learning new job responsibilities, or taking on supervisory roles at work. A 2016 study of young adults diagnosed with insomnia found that they tend to confuse tiredness with sleepiness, and it is known that going to bed when tired but not sleepy is a perpetuating factor for insomnia [24]. Tiredness is related to fatigue or exhaustion and consists of low energy and lack of focus, while signs of sleepiness consist of head bobbing, eyes being heavy, and yawning. If one tries to sleep while tired, it may result in rest, but possibly not sleep. It is therefore very important to provide education on sleep health and prevention of sleep problems. It is also very important for leadership to emphasize that sleep health is central to overall health and operational readiness. Leaders should also counteract the notion that it is a sign of mental strength to just “tough it out” if an airman is experiencing significant fatigue.

The results of sleep and sleep-related behaviors as found in this study reveal areas where medical and mental health leaders and providers can direct prevention and intervention efforts for DCGS intelligence operators. It is important for DCGS community members, who are heavily engaged in working 24/7 operations, to have access to care. It is also important for medical providers to be proficient in preventing, identifying, and treating sleep-related difficulties that arise from shift work, including education on the timing of sleep medication for intelligence operators working in shifts, given that almost 23% of AD intel shift workers reported they had not received education on the appropriate timing of medication compared to their counterparts working day shift. Currently there is no aeromedical policy regarding the use of OTC and prescription sleep medication among airmen working in DCGS. It may be helpful to outline appropriate use guidelines for controlled sleep aid medications such as Ambien for this population as a fatigue management strategy among those in the midst of shift change or other mission-related demands. If prescription medication is used for sleep management on a short-term basis, alongside medical provider consult in long-term behavioral sleep management skills and stimulus control, the risk of airmen improperly using OTC medication or heavily relying on other substances such as alcohol and caffeine may be significantly reduced.

Mental health providers should continue to be embedded within DCGS units to provide leadership with education and consultation on sleep health and optimal scheduling to ensure adequate recovery between shift changes. One particular problem that seemed to emerge from the sleep data in this study is that many intelligence operators working on shift seem to experience sleep inertia while driving to and from work, up to 20 times a month according to write-in responses. Mental health providers can educate both line leadership and airmen on ways to prevent sleep inertia through adaptive sleep behaviors and optimal scheduling. These embedded providers can also educate airmen on appropriate use of OTC and prescription sleep

medication, emphasize that adaptive behavioral sleep management strategies are the best long-term solution, and individually tailor sleep interventions within units (i.e., having an airman struggling with insomnia complete sleep logs or observe activity monitors to optimize his/her sleep).

5.3 Physical Exercise

Survey results suggest that a significant proportion of DCGS community members are not achieving the exercise frequency and intensity as recommended by the Centers for Disease Control and Prevention and the U.S. Department of Health and Human Services. The U.S. Department of Health and Human Services Physical Activity Guidelines for the U.S. population recommends at least 150 minutes a week of moderate-intensity or 75 minutes a week of vigorous-intensity aerobic physical activity for maximum health benefits [25]. Additionally, the World Health Organization physical activity guidelines recommend muscular strength training sessions two or more days per week [26].

The frequency of moderate to vigorous exercise in 20- to 30-minute sessions was queried in this survey. Given this query, it is modest to estimate that 61.1% of DCGS intelligence operators and 60.1% of DCGS ANG/Res intel operators are meeting or exceeding the aforementioned recommendations for exercise frequency to meet maximum health benefits. This proportion is comparable to national data, with 55.5% of U.S. adults reporting that they exercise 3 or more days per week [27]. There were no proportional differences found among the four comparison groups in frequency of exercise, and this proportion was similar to the 2014 DCGS intelligence operators' self-report on exercise, with 62.2% meeting public health recommendations on frequency of exercise [1].

Although there were no proportional differences found between the groups in frequency of exercise, AD intel operators were twice as likely to report that they cannot meet their fitness requirements because of their schedule as were their support counterparts. Given that 61.46% of AD intel operators report working in shifts compared to 36.10% of their support counterparts and that AD intel operators are twice as likely to report being unable to adhere to mandated fitness requirements due to their schedule suggests that intelligence operators are not engaging in the same amount of overall physical activity, scheduled exercise, and intermittent activity combined [28], even though a difference in scheduled fitness training was not observed between these two groups. A more sedentary work style combined with the effects of already identified shift work, poor sleep, and other factors may also be contributing to the lower reported rate of success in achieving required fitness standards among active duty intelligence operators.

A meta-analysis of self-report versus direct observation of physical activity revealed that self-report measures were both higher and lower than direct measures of physical activity; thus, the aforementioned results may be more nuanced than what is measured by self-report in this study [29]. Future health assessment may benefit from use of both direct and self-report measures of physical activity to help garner more comprehensive information on overall exercise behaviors in this population.

The pressure to maintain physical standards is especially difficult with the majority of DCGS intelligence operators working in shifts. It seems more likely that service members who are more advanced in their career and simultaneously faced with slowing metabolism fall into this problematic issue more often. This study found that ANG/Res intel operators were 1.55 times as likely to report doing no strength training during the week compared to AD intel (14.78% of AD intel vs. 18.78% of ANG/Res intel are 36+ years old). Currently, the USAF is 9% overweight, which is more than double the 4.3% reported in 2011 [30]. One can speculate

that this increase is due to a number of factors, including the increased ops tempo across the USAF and a particularly strong manpower surge in the remote warrior arena (RPA, ISR, cyber), and particularly in the RPA mission area. The Deputy Chief of Manpower, Personnel and Services recently expressed in an interview that she questions "how much brawn the military needs and how much intellect? I think about a cyber warrior. Do I care what a cyber warrior weighs? Do I care if he can run a mile and a half in 12 minutes?" [31]. It is yet to be determined whether these musings will result in USAF-wide policy change. In the meantime, line leadership must still foster strategies to maintain manpower fitness. Remote warrior leaders of 24/7 missions, like DCGS, may wish to establish designated fitness areas within or nearby their unit buildings to provide more opportunities for exercise. Leadership may also consider leveraging embedded medical and mental health professionals to offer "coaching" support to those individuals who are particularly struggling with physical wellness. Examples could include meeting with these persons in small groups and brainstorming tailored solutions, forming friendly team competitions such as "biggest loser" contests, or hosting running/walking clubs within units where members are having difficulty in maintaining USAF fitness standards.

The recent USAF-wide emphasis to both document and provide counseling for obesity may help with prevention and intervention of weight problems. In fact, the increased statistics of 4.3-9% obesity rate may be more reflective of increased documentation by medical providers. It is important for healthcare providers to address how to increase the number of exercise sessions per week with their patients and connect them with available programs that address appropriate nutritional intake during appointments. Alternately, they may seek to work with both behavioral health providers and embedded mental health providers in collaborating with individuals who are particularly at risk. It is important to incorporate motivational interviewing techniques and effective problem-solving techniques such as SMART (specific, measurable, achievable, realistic, and time-based) goals with individuals to support behavior changes related to fitness.

5.4 Alcohol Usage

The current survey questions addressing alcohol were modified to include 1) standardized alcohol screening tool (AUDIT-C), 2) revised categories for males and females for drinking frequency and drinks per day, and 3) a specific question addressing binge drinking behavior (consuming more than six drinks on one occasion). This modification allows for select comparisons to 2014 findings while also helping to more accurately assess alcohol consumption patterns and allows for more meaningful comparisons with current general population data.

The division of this study's sample between "more than monthly" and "monthly or less" mirrors the NSDUH in its definition of a current alcohol user as someone who has consumed alcohol in the previous 30 days [32]. Based on the NSDUH definition, 56.0% of American adults are current alcohol users, with 18- to 25-year-olds accounting for slightly more use, at 58.3% and 55.6% of individuals aged 26 and older. This is quite similar to the proportion of female and male DCGS current alcohol consumers (83.94% and 81.72%, respectively), suggesting that the proportion of DCGS intel operators consuming alcohol is fairly comparable to the proportion of adults in the general population currently consuming alcohol.

Comparisons between DCGS active duty intel operators with their non-intel counterparts reveal differences that should raise some concern among line leadership and medical providers. In regard to the prevalence of alcohol consumption, a larger proportion of AD intel males reported drinking 2-3 times a week compared to AD non-intel males. Additionally, an even more concerning finding is that AD intel males are 5.05 times as likely to drink 4+ times during the

week. Perhaps certain cultural norms or unique stressors exist within the DCGS intel community related to increased alcohol use that need to be further examined in future studies.

Findings for female DCGS intel reveal that a larger proportion of ANG/Res intel females drink 1-2 drinks per day compared to AD intel females. Although this finding could be explained by the older average age of ANG/Res intel operators (e.g., education and income level have been shown to be positively correlated with the likelihood of being a current alcohol user [33,34], there were still some concerning behavior patterns around alcohol that emerged among younger, active duty females. They were 3.18 times more likely to report binge drinking than their ANG/Res female intel counterparts and 5.10 times more likely to meet the AUDIT-C secondary threshold. The AUDIT-C measures a number of issues from drinking over recommended limits (acutely or chronically) to meeting criteria for alcohol dependence. A study of the association between binge drinking and deployment in active duty and ANG/Res U.S. servicewomen found that deployment to Iraq or Afghanistan was associated with greater likelihood of reporting binge drinking compared to no deployment among active duty females, but not among women in the ANG/Res [35]. Additionally, lower ranking active duty women were more likely to engage in binge drinking behavior and endorsed binge drinking in greater proportion than those in the ANG/Res [35]. Taking in the aforementioned findings on forward-deployed females and those working DCGS, the "deployed-in-garrison" nature of the DCGS mission may be related to the rate of alcohol misuse or abuse in this Total Force population, but especially among the young, active duty females. This job-related risk factor needs further investigation in future studies within this community.

The most common form of excessive alcohol intake is binge drinking, which has been estimated to contribute to half of all alcohol-related fatalities and three-quarters of the economic costs associated with excessive alcohol use [36]. The current results indicate that 32.2% of male and 19.36% of female AD intel operators reported some degree of binge drinking behavior and 5.46% of male and 2.89% of female AD intel operators endorsed binge drinking on at least a monthly or weekly basis. No statistically significant differences emerged for binge drinking frequency between the four comparison groups for males. For females, ANG/Res intel operators were more likely to endorse "never" engaging in binge drinking than their active duty female intelligence operators.

The most recently published survey on drug use and health reported that almost 26.9% of American adults report binge drinking within the past month. This statistic represents all adults over 18 years old [37]. When looking at national data broken down by age, among young adults age 18-25, 39.0% reported binge drinking in 2015, and among adults age 26 or older, the rate of binge drinking was 24.8% [37]. For males age 18-25, 41.3% reported binge drinking in the past month, and for females age 18-25, 36.8% reported binge drinking. For males age 26 and older the percentage of binge drinking is slightly less, at 30.5%, and for females age 26 and older the percentage goes down by almost half at 19.6%. While there are differences between this survey and the NSDUH regarding inquiry of the timeframe in which the most recent binge drinking episode took place, generally the reported rates of binge drinking, based on gender, do suggest similar trends.

The AUDIT-C measures alcohol misuse, from drinking above recommended limits (acutely or chronically) to meeting criteria for alcohol dependence. In this current DCGS sample, 17.57% of males and 15.9% of females had AUDIT-C scores indicative of alcohol misuse. There were no statistically significant differences between comparison groups for males, while female AD intel operators were more likely to meet criteria than ANG/Res intel operators.

A yearlong cross-sectional study of around 1300 adults presenting to a civilian family medicine clinic is the most recently published data on the AUDIT-C. The observed rates of

above-threshold AUDIT-C scores were somewhat lower (26.6% of males and 14.1% for females) [36], but fairly comparable to observed rates in the current DCGS sample for both males and females.

Both AD intel males and females were significantly more likely to report they had increased their alcohol consumption since being assigned to their current duties. The results of qualitative analysis of participants' textual responses to the most frequently cited reasons for an increase in alcohol use include *turning the legal age to drink (i.e., 21 years); occupational and personal stress; social events, interactions and, for AD intel only, assignment location and culture.* Line leadership can respond to these textual responses in a manner that acknowledges the unique challenges inherent in a given geographic and organizational climate. Leadership can help foster a positive climate of using adaptive behaviors to cope with stress such as engaging in physical exercise, receiving adequate rest between work shifts, and changing local, cultural norms that may inadvertently support alcohol misuse. Line leadership can also reach out to local mental health resources such as ADAPT [alcohol and drug abuse prevention and treatment] substance abuse counselors or embedded mental health providers to encourage an atmosphere of responsible drinking and finding healthy ways to cope with stress or boredom, both of which may be salient issues depending on geographic locations.

Healthcare providers at MTFs should seek to streamline alcohol misuse prevention programs and coordinate with local public health resources to address medical referrals for anyone reporting above the secondary threshold on the AUDIT-C. This may be accomplished through the use of a behavioral health provider (psychologist or social worker) usually located within a primary care clinic. The behavior health provider can address positive screenings and provide immediate counseling and feedback to the active duty member's healthcare provider. This behavioral health provider can also glean specific cultural factors within a squadron that may be tied to alcohol misuse.

5.5 Tobacco Use

The current study indicates that overall, both active duty and ANG/Res DCGS intel and non-intel operators consume tobacco/nicotine products at a proportionately lower rate than the general population. Substance Abuse and Mental Health Services Administration (SAMHSA) data from 2015-16 indicate that 25.7% of Americans consume tobacco/nicotine in some form, with young adults (18-25 years old) consuming at a higher rate (33.0%) than adults 26 years of age and older (24.5%) [37].

Similar to findings in the 2014 DCGS health assessment, approximately 15.83% of DCGS AD intel operators endorsed the use of tobacco products (16-19% in 2014). Although significantly lower than national norms, the tobacco/nicotine utilization pattern for AD intel operators diverts from national trends in that there is a higher proportion of older adults (17.01%) endorsing use of tobacco products as compared to young adults (13.33%). This suggests either late-life initiation of tobacco use in this population or the resumption of use among those who had previously quit. According to CDC reports, in general, the odds of starting to smoke for the first time after 26 years of age are quite low [38]. While more study is required to better understand the reason behind this older age group trend among intelligence operators, a deviation from national norms among this population is not unprecedented.

Write-in responses to open-ended questions about reasons for an increase in tobacco use included being an *opportunity to take a break from work, step outside the building; coping with work stress and administrative workload; and social smoking*. The proportion of intelligence operators endorsing use of tobacco is only slightly changed since 2014, when it was 13.71%.

Because the current study inquired about tobacco/nicotine use patterns in a much more specific manner, this is the only available comparison with 2014 data.

New to this survey were queries of specific types of tobacco/nicotine products. Data on smoking tobacco use indicate that between 8.89-10.27% of AD DCGS intel operators smoke tobacco products. For smoking tobacco, the proportion of young adult DCGS intel operators does not appear to be different from those operators 26 and older. The most popular responses to open-ended questions about frequency of cigarette use ranged from one pack of cigarettes a day to a few cigarettes a week; for cigars the frequency ranged from one a week to a few times a year. General population data from the 2015 NSDUH indicate that 21.0% of adults age 18 or older currently smoke cigarettes [5]. Comparison to this general population data indicates that DCGS intel operators smoke tobacco much less frequently that the general population. A similar trend was observed for AD non-intel operators and ANG/Res intel operators with no significant differences between them for current smoking tobacco use. When asked if consumption of tobacco had increased since being assigned to their current duties, AD intel operators had a 2.06 times greater likelihood of endorsing an increase compared to ANG/Res intel operators.

For smokeless tobacco (e.g., chew, dip, snuff, etc.), 3.7% of 18- to 25-year-old AD intel operators and 4.45% of their older counterparts endorsed using these products. DCGS intel operators' smokeless tobacco use is fairly consistent with the smokeless tobacco use endorsed by both non-intel operators and ANG/Res intel operators and with the general population. The most recent data indicate that 5.4% of American adults age 18-25 and 3.2% of adults age 26 and older are current users of smokeless tobacco. Although the data for both smoking and smokeless tobacco use for the DCGS community appear at or below national norms, the use of either form of tobacco has serious health consequences, and there should be concerted effort to reduce use to prevent tobacco-related illnesses.

The last type of tobacco/nicotine products that were assessed in this survey was "alternative nicotine" products, which include e-cigarettes, nicotine gum, and nicotine patches. The current results indicate that a higher proportion of AD non-intel personnel endorse use of these products, 14.29% in 18- to 25-year-olds, compared to 3.43% of AD non-intel operators 26 years and older. A smaller percentage of AD DCGS intel operators endorse use of these products (between 5.14% and 5.43%). As a general rule, younger participants more frequently endorsed using alternative products, among both active duty and ANG/Res intel operators. According to the 2014 National Health Interview Survey, 3.7% of adults in the general American population use e-cigarettes [38]. Further study regarding the use of alternative nicotine products is warranted, not only among the sampled DCGS personnel but across the general population to better understand utilization trends and their impacts.

The recommendations based on current outcome data for tobacco/nicotine use in the DCGS community remain in congruence to 2014 recommendations. The results of the qualitative analysis of written responses to open-ended questions provide insight into early intervention strategies for both line and medical leadership. For instance, medical and line leadership can offer education on tobacco and alternative nicotine (e.g., vaping) use early in the assignment process to dissuade airmen from using tobacco/nicotine products as a way to reduce stress. Line leadership may also employ strategies such as designating certain outdoor areas as smoke-free zones to encourage airmen to take rest breaks where they are not exposed to second-hand smoke and foster an atmosphere where it is acceptable to take a break from work without the social pressure to smoke. Research has indicated that nicotine addiction is linked to an increase in stress [39], and those who have quit use of tobacco successfully report a decrease in stress [40]. Line leadership can also utilize embedded mental healthcare providers to help units identify and mollify sources of stress to reduce overall use of tobacco.

Medical leadership can offer support to those who wish to quit by mentioning smoking cessation groups to airmen who endorse tobacco/nicotine use during an appointment and be willing to participate as a care manager for those who seek smoking cessation medication in smoking cessation groups.

5.6 Caffeine and Energy Beverage Usage

Approximately 79.24% of AD DCGS intel operators (74.38% of those age 18-25 and 81.46% of those 26 and older) endorsed caffeine consumption in the past month. This is very similar to the overall rate of 81.74% in 2014 [1]. AD intel operators reported caffeine consumption at a statistically higher rate than AD non-intel operators in terms of drinking traditional caffeinated beverages (e.g., coffee and tea) and energy drinks. This is also true of AD intel operators when compared to ANG/Res intel operators. These AD intel operators also reported an increase in caffeine use, citing the following reasons: *long work hours and high workload, shift work (mids or nights) in general or changing from one shift to another shift, and sleep issues.*

Although overall consumption is lower than the most recent estimates of 89% of the general adult population in the United States [41], the trend of increased consumption observed within the DCGS intel operators warrants concern. For example, 29.32% of AD intel operators consume a combination of traditional and energy drinks, and 44.71% of these airmen consume more than three servings of traditional caffeine on a daily basis. This combination of rates and reasons of use suggests that DCGS intel operators regularly use caffeine as a way to manage their readiness and performance. Looking further into caffeine consumption patterns, DCGS intel operators were 2.66 times more likely to endorse an increase in caffeine consumption since being assigned to their current duties compared to their non-intel counterparts. Additionally, around 35.96% of DCGS intel operators age 18-24 and 30.14% age 26 and older report consuming at least one designer energy drink on a daily basis. This is comparable to the proportion of non-intel operators (30.27% overall) consuming energy drinks.

A study of active duty Navy and Marine Corps personnel from 2016 found similar results to the current study, with 28% of service members consuming energy beverages [42]. An earlier study of active duty Army personnel found an even higher rate (39%) that reported consuming energy drinks on a daily basis [43]. A 2014 study from the civilian sector reported approximately 4.3% of the general adult population consumed energy drinks (10% of those age 18-24) daily, and caffeine intake from these drinks represented 2% of total daily mean values of caffeine (165 ± 1 mg for all ages combined) [44]. Research of energy drink consumption among college-aged students (2011) revealed that between 42-51% consume energy drinks in a given month [45,46]. Energy drink consumption is clearly prevalent within the armed services and appears to be notably higher than the rate of use within the general population. Consumption trends within the DCGS sample suggest additional contributing factors that may be at play in affecting rates at the sub-group level.

Shift work emerges as a significant factor in the rate and nature of caffeine consumption among DCGS sub-groups. AD intel operators who are shift workers were more likely to report an increase in caffeine use (41.56%) as compared to AD intel operators working standard days (23.25%). It also appears that energy drinks are the caffeinated option of choice for coping with shift work, particularly among AD intel shift workers (37.78% reported use) as compared to AD intel counterparts working standard days (27.98%). Alternately, AD non-intel personnel are more likely to prefer traditional sources of caffeine such as sodas, as this group was 1.44 times more likely than AD intel operators to endorse such usage.

When considering the similarities of overall caffeine utilization by AD intel operators in 2014 and 2016, and reported variations based on work schedule, combined current findings point to some shifting in sources of caffeine as opposed to substantial increases in overall caffeinated beverage consumption. The shift in source of caffeinated beverage to the energy drink option does, however, bring with it additional stimulants that must be considered when assessing health impact.

While a precise assessment of the milligrams of caffeine consumed on a daily basis of both traditional sources of caffeine (e.g., coffee/tea/soda) and designer beverages is difficult to obtain, the health consequences of excessive usage may adversely affect performance and readiness [47,48]. The results of the current study indicate that approximately 29.32% of DCGS intel operators report consuming both traditional and designer energy beverages on a daily basis. Ingredients in designer energy drinks may enhance the effects of traditional caffeine, have a negative impact on medications used to control certain health conditions such as hypertension, and aggravate certain medical conditions such as headaches or gastrointestinal problems. Further inquiry into designer energy beverage consumption is recommended given the growing popularity and ubiquity of these beverages and their use as a coping strategy for managing fatigue, particularly for shift workers.

The results of this reassessment expand upon findings from 2012 and 2014 in terms of shift work and high workload playing a large contributory role in increased caffeine use in DCGS personnel. The culture of overreliance on designer energy beverages, especially while working in shifts, should be addressed and service members should be educated on the negative side effects of overuse of any caffeine products.

Leadership should take note of trends in younger airmen using designer energy beverages mixed with alcohol, given the dangerous combination of effects on one's health as well as prior research indicating that those who mix these two substances are also more likely to binge drink [49]. Research found that over 8000 emergency room visits in 2011 involved mixing energy drinks with alcohol, with 8% resulting in hospitalization [50].

Another possible negative long-term effect of overuse of designer energy drinks is related to the high sugar content found in these beverages. There is a concern that youth are substituting sugar-sweetened beverages with energy drinks because added sugar intake from sugary beverages in total has decreased since 1999, while added sugar intake from energy beverages has increased in the same time period [51].

Some have speculated the overuse of caffeine, and especially designer energy beverages, can have a deleterious effect on a service member's fight or flight response [52]. While caffeine can initially help a service member be mission ready in a deployed environment, the easy availability and overuse of drinks (e.g., "rip-its") or other designer energy beverages can lead to insomnia, depression, hypertension, and anxiety [52]. It may be helpful to also provide easily accessible sugar-free or caffeine-free alternative beverages in the deployed or in-garrison environment. Strategic use of caffeine products is recommended to achieve the most advantageous results. Leadership can educate service members early in the training pipeline on how to use energy beverages (preferably sugar-free) or more traditional caffeine beverages in a smart manner to reap the most beneficial results.

Medical providers should evaluate all the varieties of caffeinated beverage consumption in service members. The trends in increased caffeine use, especially for shift workers, should be assessed and behavioral education echoing what was recommended in the previous section to line leadership should be provided. It is well known that overuse of caffeine products can exacerbate certain medical conditions; thus, emphasis should be on strategic use of caffeine

products, such as using caffeine products at the beginning of a shift and abstaining from use at least 3 hours prior to the end of a shift, to prevent sleep onset interference [18].

5.7 Self-Reported Changes in Medical Symptoms and Conditions

A significant proportion of AD DCGS intel operators self-reported negative changes in their health status and health behaviors compared to both their non-intel and ANG/Res counterparts. These responses are generally similar to results from the previous assessment of medical conditions made worse by one's work assignment. In this study's findings, a larger proportion of AD intel operators reported increased headaches, eye strain/vision problems, musculoskeletal injury/pain, sleep problems, and depression compared to their non-intel and ANG/Res intel counterparts. These health conditions appear to be worse among shift workers, particularly for DCGS intel shift workers. AD intel DCGS shift workers were approximately twice as likely to report headaches and/or eye strain/vision problems (41.07% vs. 22.30%), musculoskeletal injury/pain (31.91% vs. 15.11%), and sleep problems (31.55% vs. 12.23%) compared to AD non-intel shift workers. These findings shed light on the intense demands and high workload that DCGS shift workers face. These differences remained stable when making within-group comparisons as well, with both AD DCGS shift workers and ANG/Res intel shift workers more likely to report both the aforementioned physical problems and depression symptoms compared to their day shift counterparts.

It appears that, for AD DCGS intel personnel, the lack of adequate/restful sleep that results from working shifts may have a negative, bidirectional effect on eye strain/vision problems experienced from looking at video monitors and screens. Results from write-in responses to the question "What actions are needed to improve your medical care?" reveal insights into this matter. Greater accessibility of medical services, better quality of medical services, and ergonomic work stations were the most common responses to this question.

AD intel shift workers also reported not having consistent access to mental health services compared to their non-intel counterparts, and it appears that shift work is a barrier to seeking mental health services, with a higher number of active duty shift workers reporting difficulty with access (12.83% vs. 1.60%) compared to those working standard days. Perhaps due to the increased likelihood of working in shifts, AD intel operators were 2.27 more likely than non-intel operators to report that mental health services are not consistently available. Similar to the 2014 results, the reasons for increased mental healthcare utilization were *work stress, felt the need to talk with someone about specific events (work/personal), and family or personal issues.*

Also, it appears that AD DCGS intel operators are more than twice as likely to endorse an unreported injury or illness compared to their non-intel counterparts. The perception of having less access to medical care may result in intel operators self-medicating or underreporting illness or injuries, putting overall mission readiness at risk. Similar to results from 2014, the qualitative analysis revealed that the most frequently cited reasons for increased medical care utilization were *pain management (age related or general), injury or illness, and sleep issues (in general or related to stress).*

Responses to items assessing an increase in prescription medication usage looked similar to the 2014 results with a little more than 17% of current DCGS intel operators reporting an increase in prescription medication utilization. DCGS intel operators were no more likely than their non-intel or ANG/Res counterparts to endorse an increase in prescription medication utilization.

More than 16% of current DCGS intel operators endorsed an increase in OTC medication utilization since being assigned to their current duties. The most commonly reported reasons for their increase were directly related to the medical conditions they reported: allergies, sleep problems, and pain management (including headaches and muscle pain). Nature of duties may also play a role in this increase of OTC medication, with 18.89% of AD DCGS intel operators reporting an increase in utilization as compared to 6.38% of their non-intel counterparts, both groups working shift schedules at the same operational locations. Given the aforementioned results regarding the use of medical services utilization, the likelihood of medical providers tasked with managing DCGS intel operators' health actually being aware of how and when these OTC medications are being used is low, while the problems and risks associated with self-medication are notable and well established.

Line leadership is encouraged to continue improvements in the ergonomic design of work stations to reduce physical health problems such as neck and back pain. Lighting configurations could be modified to help reduce eye strain or headaches as well as help day-to-night shift rotations. Overall, it is recommended that leadership continue their initiatives to improve environmental conditions of workspaces to accentuate performance and improve health.

It appears that embedded mental healthcare providers are being utilized by participants in this study, with military operational psychologists or mental health technicians utilized more than military medical providers or employee assistance services (5.71% of AD DCGS intel operators and 4.57% of non-intel operators reported utilization of embedded mental healthcare providers, specifically military operational psychologists and mental health technicians). These results will need to be further analyzed with comparison to traditional access to services to determine if these embedded providers improve access to mental and medical health services.

This study provides further support to recommendations regarding access to care from 2014. This study found that shift workers in intel are proportionally more likely to report decreased access to care compared to their non-intel counterparts. There is a current endeavor across intel major commands to embed medical and mental healthcare providers within intel units outside of normal duty day hours to increase access to care. Training and evaluation of these embedded healthcare providers are currently underway and results will soon be communicated across major commands.

All intel squadrons in DCGS would benefit from consultation services to leadership with continued monitoring of the occupational health status of each unit. Such consultation should include medical and mental health providers conducting anonymous surveys (using brief, standardized outcome measures) for symptoms of burnout and distress as well as a variety of health habits that affect readiness and performance. This information provided to leadership will help provide situational awareness for areas that could be affecting performance and insights necessary for developing precise and effective health and performance improvement campaigns within squadrons.

6.0 STRENGTHS AND LIMITATIONS OF THE STUDY

Self-report questionnaires can be prone to response bias due to the voluntary nature of the sample, which might affect the ability to generalize results. This sampling bias may manifest in the sample through respondents who are at extreme ends of risk and who want to communicate their concerns. However, this type of sampling bias can actually render positive rather than negative impact on results because of its ability to highlight risk and thereby aid leadership and medical providers in understanding and identifying the intended at-risk population. Additionally,

since obtaining health behavior data on intelligence personnel can be relatively difficult, efforts that maximize self-disclosure, like this anonymous, self-reporting survey methodology, can facilitate garnering far more accurate data and "true prevalence" rates of specific behavioral health behaviors and related conditions as opposed to analyzing medical records and encounters of intelligence personnel, which may not provide an accurate "picture" of the issues within this community.

The presence of USAF comparison groups assigned to the same location offers a unique strength of this study, however, because it gives this study the ability to make more definitive conclusions about changes and challenges within the DCGS community. Although analyses of written responses provide reasons for increased use of alcohol, tobacco, caffeine, medical/mental healthcare, and medication usage (prescription and OTC), additional studies are needed for making definitive statements about this community.

A few items within the current study's survey limited the ability to conduct certain direct comparisons with national trends or diagnostic thresholds. Format adjustments to these questions have been made for future survey data collection. Additionally, the results of this study did not fully address the functional impairment of select health behaviors, such as lack of sufficient sleep and substance use. Individuals who report increased levels of sleep problems, high medical utilization/medical problems, and substance use do not necessarily require professional treatment. The current study could be improved through the simultaneous assessment of functional impairment to support the validity of the assumed impact on performance that is made. Despite these limitations, the current findings support the perception that working 24/7, real-time, deployed-in-garrison operations may place one at a unique risk for adverse health consequences that would benefit from being addressed by line leadership and MTFs.

7.0 CONCLUSION

The DCGS intel operators who maintain around-the-clock, essential battlefield operations face unprecedented prolonged physical, psychological, and emotional demands. Organizational and environmental elements such as work schedules, manning status, length of assignment, and possibly local climate can present additional stressors and difficulties that can adversely impact the health and wellness of these intelligence operators. The increased substance use, medical concerns, and healthcare utilization do not have to be necessary outcomes for DCGS operators. The current study results suggest that modifications to factors in the DCGS work environment, such as frequency of work shift changes and total number of hours worked per week, may go a long way to address primary and secondary prevention of deleterious health behaviors and outcomes. Other strategies on the part of line and medical leaders can further contribute to the optimization and resiliency of this dynamic and critical workforce.

8.0 REFERENCES

1. Chappelle W, Prince L, Goodman T, Thompson W, Cowper S, Ray-Sannerud B. Occupational health screenings of the virtual warrior: distributed common ground system intelligence operators compared with non-combatant support personnel. Wright-Patterson AFB (OH): U.S. Air Force School of Aerospace Medicine; 2014. Technical Report AFRL-SA-WP-TR-2014-0003.
2. Prince L, Chappelle W, McDonald K, Goodman T. Main sources of occupational stress and symptoms of burnout, clinical distress, and post-traumatic stress among distributed common ground system intelligence exploitation operators (2011 USAFSAM survey results). Wright-Patterson AFB (OH): U.S. Air Force School of Aerospace Medicine; 2012. Technical Report No. AFRL-SA-WP-TR-2012-0010.
3. Prince L, Chappelle WL, McDonald KD, Goodman T, Cowper S, Thompson W. Reassessment of psychological distress and post-traumatic stress disorder in United States Air Force Distributed Common Ground System operators. Mil Med. 2015; 180(3 Suppl):171-178.
4. American Psychological Association. How stress affects your health. [Accessed 5 Sep 2016]. Available from http://www.apa.org/helpcenter/stress.aspx.
5. Center for Behavioral Health Statistics and Quality. Results from the 2015 National Survey on Drug Use and Health: detailed tables. Rockville (MD): Substance Abuse and Mental Health Services Administration; 2016. [Accessed 1 Dec 2016]. Available from https://www.samhsa.gov/data/sites/default/files/NSDUH-DetTabs-2015/NSDUH-DetTabs-2015/NSDUH-DetTabs-2015.pdf.
6. Bush K, Kivlahan DR, McDonell MB, Fihn SD, Bradley KA. The AUDIT alcohol consumption questions (AUDIT-C): an effective brief screening test for problem drinking. Arch Intern Med. 1998; 158(16):1789-1795.
7. Zar JH. Biostatistical analysis, 4th ed. Upper Saddle River (NJ): Prentice Hall; 1999:564, App64.
8. Prince L, Goodman T, Chappelle W. Total Force Perspectives on occupational stress among distributed common ground system operators. Mil Med. 2017 [In press].
9. National Sleep Foundation. National Sleep Foundation recommends new sleep times. 2015 Feb 2. [Accessed 7 Dec 2015]. Available from https://sleepfoundation.org/media-center/press-release/national-sleep-foundation-recommends-new-sleep-times.
10. Watson NF, Badr MS, Belenky G, Bliwise DL, Buxton OM, et al. Recommended amount of sleep for a healthy adult: a joint consensus statement of the American Academy of Sleep Medicine and Sleep Research Society. Sleep. 2015; 38(6): 843-844.
11. McCarthy J, Brown A. Getting more sleep linked to higher well-being. 2015 Mar 2. [Accessed 20 Mar 2017]. Available from http://www.gallup.com/poll/181583/getting-sleep-linked-higher.aspx?version=print.
12. Orzeł-Gryglewska J. Consequences of sleep deprivation. Int J Occup Med Environ Health. 2010; 23(1):95-114.
13. Troxel WM, Shih RA, Pedersen ER, Geyer L, Fisher MP, et al. Sleep in the military: promoting healthy sleep among U.S. servicemembers. Santa Monica (CA): RAND Corporation; 2015. [Accessed 1 Dec 2016]. Available from http://www.rand.org/pubs/research_reports/RR739.html.
14. Spielman AJ, Caruso LS, Glovinsky PB. A behavioral perspective on insomnia treatment. Psychiatr Clin North Am. 1987; 10(4):541-553.

15. Spielman AJ, Glovinsky PB. Introduction. In: Hauri PJ, ed. Case studies in insomnia. New York (NY): Plenum Publishing Corporation; 1991.
16. Ostrowski KA. Psychological health outcomes within USAF remotely piloted aircraft support career fields [Doctoral dissertation]. Daytona Beach (FL): Embry-Riddle Aeronautical University; 2016. [Accessed 1 Feb 2017]. Available from http://commons.erau.edu/cgi/viewcontent.cgi?article=1202&context=edt.
17. Akerstedt T, Ingre M, Broman JE, Kecklund G. Disturbed sleep in shift workers, day workers, and insomniacs. Chronobiol Int. 2008; 25(2):333-348.
18. Åkerstedt T, Wright KP Jr. Sleep loss and fatigue and shift work and shift work disorder. Sleep Med Clin. 20009; 4(2):257-271.
19. Akerstedt T. Shift work and disturbed sleep/wakefulness. Occup Med (Lond). 2003; 53(2):89-94.
20. Tvaryanas AP, Thompson WT. Fatigue in military aviation shift workers: survey results for selected occupational groups. Aviat Space Environ Med. 2006; 77(11):1166-1170.
21. Tvaryanas AP, Thompson WT. Recurrent error pathways in HFACS data: analysis of 95 mishaps with remotely piloted aircraft. Aviat Space Environ Med. 2008; 79(5):525-532.
22. Vogel M, Braungardt T, Meyer W, Schneider W. The effects of shift work on physical and mental health. J Neural Transm (Vienna). 2012; 119(10):1121-1132.
23. Pillitteri J, Kozlowski LT, Person DC, Spear ME. Over-the-counter sleep aids: widely used but rarely studied. J Subst Abuse. 1994; 6(3):315-323.
24. Akram U, Ellis JG, Myachykov A, Barclay NL. Misperception of tiredness in young adults with insomnia. J Sleep Res. 2016; 25(4):466-474.
25. Physical Activity Guidelines Advisory Committee. Physical Activity Guidelines Advisory Committee report, 2008. Washington (DC): U.S. Department of Health and Human Services; 2008. [Accessed 29 May 2016]. Available from https://health.gov/paguidelines/report/pdf/CommitteeReport.pdf.
26. World Health Organization. Global recommendations on physical activity for health. Geneva: World Health Organization; 2010. [Accessed 1 Dec 2016]. Available from http://www.who.int/dietphysicalactivity/factsheet_recommendations/en/.
27. Riffkin R. So far in 2015, more Americans exercising frequently. Well-Being. 2015 Jul 29. [Accessed 7 Dec 2015]. Available from http://www.gallup.com/poll/184403/far-2015-americans-exercising-frequently.aspx?g_source=exercise&g_medium=search&g_campaign=tiles.
28. Loprinzi PD. The effects of shift work on free-living physical activity and sedentary behavior. Prev Med. 2015; 76:43-47.
29. Prince SA, Adamo KB, Hamel ME, Hardt J, Connor Gorber S, Tremblay M. A comparison of direct versus self-report measures for assessing physical activity in adults: a systematic review. Int J Behav Nutr Phys Act. 2008; 5:56.
30. Tilghman A. And the fattest U.S. military service is… 2016 Oct 9. [Accessed 1 Dec 2016]. Available from https://www.militarytimes.com/news/your-military/2016/10/09/and-the-fattest-u-s-military-service-is/.
31. Public JQ. Air Force finally coming around on fitness. 2016 Oct 13. [Accessed 1 Dec 2016]. Available from https://www.jqpublicblog.com/air-force-finally-coming-around-fitness/.
32. Center for Behavioral Health Statistics and Quality. Behavioral health trends in the United States: results from the 2014 National Survey on Drug Use and Health. Rockville (MD): Substance Abuse and Mental Health Services Administration; 2015. HHS Publication No. SMA 15-4927, NSDUH Series H-50. [Accessed 1 Dec 2016]. Available from

https://www.samhsa.gov/data/sites/default/files/NSDUH-FRR1-2014/NSDUH-FRR1-2014.pdf.
33. Center for Behavioral Health Statistics and Quality. Results from the 2014 National Survey on Drug Use and Health: detailed tables. Rockville (MD): Substance Abuse and Mental Health Services Administration; 2015. Available from https://www.samhsa.gov/data/sites/default/files/NSDUH-DetTabs2014/NSDUH-DetTabs2014.htm.
34. Stahre M, Roeber J, Kanny D, Brewer RD, Zhang X. Contribution of excessive alcohol consumption to deaths and years of potential life lost in the United States. Prev Chronic Dis. 2014; 11:E109.
35. Cucciare MA, Sadler A, Mengeling MA, Torner JC, Curran GM, et al. Associations between deployment, military rank, and binge drinking in active duty and Reserve/National Guard US servicewomen. Drug Alcohol Depend. 2015; 153:37-42.
36. Rubinsky AD, Kivlahana DR, Volke RJ, Maynard C, Bradley KA. Estimating risk of alcohol dependence using alcohol screening scores. Drug Alcohol Depend. 2010; 108(1-2):29-36.
37. Center for Behavioral Health Statistics and Quality. Key substance use and mental health indicators in the United States: results from the 2015 National Survey on Drug Use and Health. Rockville (MD): Substance Abuse and Mental Health Services Administration; 2016. HHS Publication No. SMA 16-4984, NSDUH Series H-51. [Accessed 1 Dec 2016]. Available from https://www.samhsa.gov/data/sites/default/files/NSDUH-FFR1-2015/NSDUH-FFR1-2015/NSDUH-FFR1-2015.pdf.
38. Schoenborn CA, Gindi RM. Electronic cigarette use among adults: United States, 2014. Atlanta (GA): Centers for Disease Control and Prevention, National Center for Health Statistics; 2015. NCHS Data Brief, No. 217. [Accessed 1 Dec 2016]. Available from https://www.cdc.gov/nchs/data/databriefs/db217.pdf.
39. Robles Z, Garey L, Hogan J, Bakhshaie J, Schmidt NB, Zvolensky MJ. Examining an underlying mechanism between perceived stress and smoking cessation-related outcomes. Addict Behav. 2016; 58:149-154.
40. McDermott MS, Marteau TM, Hollands GJ, Hankins M, Aveyard P. Change in anxiety following successful and unsuccessful attempts at smoking cessation: cohort study. Br J Psychiatry. 2013; 202(1):62-67.
41. Fulgoni VL 3rd, Keast DR, Lieberman HR. Trends in intake and sources of caffeine in the diets of US adults: 2001-2010. Am J Clin Nutr. 2015; 101(5):1081-1087.
42. Knapik JJ, Trone DW, McGraw S, Steelman RA, Austin KG, Lieberman HR. Caffeine use among active duty Navy and Marine Corps personnel. Nutrients. 2016; 8(10):620.
43. Lieberman HR, Stavinoha T, McGraw S, White A, Hadden L, Marriott BP. Caffeine use among active duty US Army soldiers. J Acad Nutr Diet. 2012; 112(6):902-912.
44. Mitchell DC, Knight CA, Hockenberry J, Teplansky R, Hartman TJ. Beverage caffeine intakes in the U.S. Food Chem Toxicol. 2014; 63:136-142.
45. Malinauskas BM, Aeby VG, Overton RF, Carpenter-Aeby T, Barber-Heidal K. A survey of energy drink consumption patterns among college students. Nutr J. 2007; 6:35.
46. Nortan TR, Lazev AB, Sullivan MJ. The “buzz” on caffeine: patterns of caffeine use in a convenience sample of college students. J Caffeine Res. 2011; 1(1):35-40.
47. Frary CD, Johnson RK, Wang MQ. Food sources and intakes of caffeine in the diets of persons in the United States. J Am Diet Assoc. 2005; 105(1):110-113.
48. Knight CA, Knight I, Mitchell DC, Zepp JE. Beverage caffeine intake in US consumers and subpopulations of interest: estimates from the Share of Intake Panel survey. Food Chem Toxicol. 2004; 42(12):1923-1930.

49. Centers for Disease Control and Prevention. Fact sheets – alcohol and caffeine. 2017. [Accessed 1 Jul 2017]. Available from http://www.cdc.gov/alcohol/fact-sheets/cab.htm.
50. Substance Abuse and Mental Health Services Administration. 1 in 10 energy drink-related emergency department visits results in hospitalization. The DAWN Report. 2014 Mar 13. [Accessed 1 Feb 2017]. Available from https://www.samhsa.gov/data/sites/default/files/spot124-energy-drinks-2014.pdf.
51. University of Maryland Francis King Carey School of Law. Energy drinks: fact sheet. (n.d.). [Accessed 1 Feb 2017]. Available from https://www.law.umaryland.edu/programs/publichealth/documents/LRC_Energy_Drinks_Fact_Sheet.pdf.
52. Jackson E. When the combat switch is broken: the dangerous effects of the military's embrace of energy drinks. 2017 Mar 16. Modern War Institute at West Point. [Accessed 1 Dec 2016]. Available from https://mwi.usma.edu/combat-switch-broken-dangerous-effects-militarys-embrace-energy-drinks/.

APPENDIX A

Group Frequency Tables, Air Force Specialty Code (AFSC) Frequency Tables

Table A-1. Group Frequencies, Frequencies of Shift Workers, Non-Shift Workers Within Groups

Group	n	%	n	% Within Group
480th Intel AD	1717	68.79		
Shift Workers	--	--	1030	61.46
Standard Day Workers	--	--	646	38.54
Total			1676	100.00
480th Non-Intel AD	394	15.79		
Shift Workers	--	--	139	36.10
Standard Day Workers	--	--	246	63.90
Total			385	100.00
ANG and Reserves Intel, DCGS Locations	312	12.50		
Shift Workers	--	--	130	42.48
Standard Day Workers	--	--	176	57.52
Total		¤	306	100.00
ANG and Reserves Non-Intel, DCGS Locations	73	2.92		
Shift Workers	--	--	29	41.43
Standard Day Workers	--	--	41	58.57
Total		¤	70	100.00
Total	2496	100.00		

Table A-2. Frequencies of Two Age Ranges Within Groups

Age Range (yr)	AD Intel		AD Non-Intel		ANG/Res Intel		ANG/Res Non-Intel	
	n	%	n	%	n	%	n	%
18-25	536	31.25	127	32.48	26	8.36	3	4.11
26+	1179	68.75	264	67.52	285	91.64	70	95.89
Total	1715	100.00	391	100.00	311	100.00	73	100.00

Table A-3. AFSC Frequencies Within Groups

Group AFSC	n	%
AD Intel	**1717**	
1N0X1	89	5.18
1N1X1-A,-B	561	32.68
1N2X1-A	46	2.68
1N2X1-C	131	7.63
1N290	4	0.23
1N3X1	517	30.11
1N4X1-A	10	0.58
1N4X1-B	183	10.66
4N0	4	0.23
14N	154	8.97
1N0	7	0.41
1N4X0	6	0.35
3N0	5	0.29
AD Non-Intel	**394**	
Cyber	311	78.93
Other AFSCs	83	21.07
ANG/Res Intel	**312**	
1N0X1	53	16.99
1N1X1-A	70	22.44
1N1X1-B	8	2.56
1N2X1-A	7	2.24
1N2X1-C	10	3.21
1N290	3	0.96
1N3X1	32	10.26
1N4X1-A	8	2.56
1N4X1-B	45	14.42
1A8X2	4	1.28
14N	72	23.08
ANG/Res Non-Intel	**73**	
Cyber	42	57.53
Other AFSCs	31	42.47

APPENDIX B

Questions Assessing Health-Related Behaviors and Utilization of Medical Services

Question	Response
Sleep	
On an average calendar day, how many hours of restful sleep do you obtain before reporting for duty and performing mission?	1 hour; 2 hours; 3 hours; 4 hours; 5 hours; 6 hours; 7 hours; 8 hours; 9 hours; 10 hours or more *Recoded: 1-4, 5-6, 7-8, 9+ for frequencies* *Recoded: 1-4, 5-6, 7+ for regression*
On an average day, do you feel adequately rested / ready for the work day when you wake?	Yes No *Other – open response*
If you answered NO, what do you think would improve your ability to be appropriately rested for your work day/night?	*Open response*
Have you ever had difficulty commuting to/from work because you thought you might fall asleep at the wheel?	Yes No
If yes, how many times has this occurred in the past month?	*Open response*
Have you sought a physician's prescription for medication to aid in sleep, since being assigned to your current unit?	Yes No
If YES, for what issue did you seek care?	Falling Asleep Staying Asleep Both Falling and Staying Asleep *Other – open response*
What medication was prescribed?	*Open response*
Have you sought over-the-counter (OTC) medication to aid in sleep, since being assigned to your current unit?	Yes No
If YES, what OTC medication are you using?	*Open response*
If you take sleep medication of any kind, have you been educated by a physician or pharmacist as to the proper timing of medication as it relates to driving, optimal performing of your work duties, and/or operating of heavy or hazardous equipment?	Yes No Not Applicable
What, if anything, would you recommend to unit leadership as a means of mitigating the negative impacts associated with sleep-related concerns?	*Open response*

Physical Exercise	
How often do you engage in moderate to vigorous, aerobic, physical activity each week (20-30 minutes of jogging/ running, fast cycling, etc.)?	0 days per week 1-2 days per week 3-4 days per week 5-6 days per week Daily *Recoded: 3+ days for regressions*
How often do you engage in moderate to vigorous strength training (weight lifting or cross-training for at least 20 minutes per exercise session)?	0 days per week 1-2 days per week 3-4 days per week 5-6 days per week Daily *Recoded: 3+ days for regressions*
Do you feel your work schedule allows you to meet your fitness requirements?	Yes No I'm not sure *Recoded: No/Not Sure for regressions*
Alcohol Use	
How often do you have a drink containing alcohol? *(AUDIT-C - Item #1)*	Never Monthly or less 2-4 times a month (once a week or less) 2-3 times a week 4 or more times a week
How many standard drinks containing alcohol do you have on a typical day (standard alcohol serving sizes = 12 oz of beer, or 5 oz of wine, or 1.5 oz of liquor)? *(AUDIT-C - Item #2)*	0; 1; 2; 3; 4; 5; 6; 7; 8; 9; 10+ *Recoded: 0; 1-2; 3-4, 5+ for frequencies* *Recoded: 0; 1-2; 3+ for males and 0; 1+ for females regressions*
How often do you have 6+ drinks on one occasion? *(AUDIT-C - Item #3)*	Never Less than monthly Monthly Weekly Daily or Almost Daily *Recoded: Weekly/Daily+*
Since your assignment to this unit, has your use of alcohol changed?	Yes No/ Not Applicable
If yes, how has it changed?	Do not drink alcohol anymore Alcohol use has decreased Alcohol use has increased *Recoded-Increase: Yes/No*
If your alcohol use changed, what do you attribute the change to?	*Open response*

Tobacco Use	
Do you currently use any kind of nicotine / tobacco product?	Yes No
If yes, what types of nicotine / tobacco products do you use? List all that apply. If you use a product that is not listed, please annotate in the other/comment field.	Smoking tobacco (cigarettes, cigars, tobacco pipes, water pipes, etc.) Smokeless tobacco (chew, dip, snuff, etc.) Nicotine alternatives (e-cigarettes, nicotine gum, etc.) *Other- open response*
How frequently do you use tobacco / nicotine products?	*Open response*
Since your assignment to this unit, has your use of tobacco / nicotine changed?	Yes No Not applicable (do not use tobacco)
If yes, how has it changed?	It has increased It has decreased
To what do you attribute the change?	*Open response*
Caffeinated Beverage Use	
Do you consume caffeinated beverages, energy drinks or other types of energy supplements?	Yes No
Do you drink caffeinated tea?	Yes No
If you drink caffeinated tea, please answer the following questions based on an average day: *(Examples for Reference: Starbucks Tall = 12 oz; Starbucks Grande = 16 oz; Starbucks Venti = 20 oz)* How many 12-oz servings do you consume? How many 16-oz servings do you consume? How many 20-oz servings do you consume?	1 2 3 4 5+
Do you drink coffee (standard brew)?	Yes No
If you drink standard brew caffeinated coffee, please answer the following questions based on an average day: How many 12-oz servings do you consume? How many 16-oz servings do you consume? How many 20-oz servings do you consume?	1 2 3 4 5+

Do you drink espresso-based designer coffee (lattes, cappuccinos, macchiatos, mochas, etc.)?	Yes No
If you drink espresso-based designer coffee, please answer the following questions based on an average day: How many 12-oz servings do you consume? How many 16-oz servings do you consume? How many 20-oz servings do you consume?	
Do you drink energy drinks (e.g., 5-Hour Energy, Red Bull, Monster, etc.)?	Yes No
If you drink energy drinks (e.g., 5-Hour Energy, Red Bull, Monster, etc.), please answer the following questions based on an average day: How many 2-oz servings of Energy Shots (i.e., 5-Hour Energy) do you consume? How many 8-oz servings of an energy drink (i.e., standard Red Bull can) do you consume? How many 16-oz servings of energy drink (i.e., standard Monster can) do you consume? How many 24-oz servings of energy drink (i.e., Mega Monster can) do you consume?	1 2 3 4 5+
Do you drink caffeinated sodas (e.g., Coke, Pepsi, Diet Coke, Diet Pepsi, Dr. Pepper, Mt. Dew, etc.)?	Yes No
Which soda do you most often drink?	*Open response*
If you drink caffeinated sodas, please answer the following questions based on an average day: How many 12-oz servings (standard can) do you consume? How many 20-oz servings (standard bottle) do you consume? How many 34-oz servings (liter bottle) do you consume?	1 2 3 4 5+
Do you use other caffeine or energy supplements (e.g., NoDoze, Alert, Vivarin, Rip Fuel, etc.)?	Yes No
If yes, which supplements do you use?	*Open response*
How frequently do you use these caffeine/energy supplements?	Occasionally (a few times per month) Frequently (a few times per week) Daily/Almost daily More than once a day

Since your assignment to this unit, has your use of caffeinated/energy drinks or stimulants changed?	Yes, it has increased Yes, it has decreased No, it has not changed Not applicable *Recoded-Increase: Yes/No*
If yes, to what do you attribute the change?	*Open response*
Medical Conditions	
Please list any medical conditions you have that you believe have been created by or made worse by occupational stress: (*multiple check list*)	Sleep issues; nausea; bowel issues; *Recoded-combined categories:* Headaches; eye strain / vision problems; *Recoded-combined categories:* neck pain; back pain; chest pain; *Recoded-combined categories:* heart palpitations; high blood pressure; heartburn; *Other - open response*
What actions are needed to improve your medical care? Please describe.	*Open response*
Please list medical conditions for which you are taking medication (prescribed or OTC).	*Open response*
Medical Services Utilization	
In general, since your current assignment, has your use of medical services changed?	Yes No
If yes, how has it changed?	Do not use medical services Use of medical services has decreased Use of medical services has increased *Recoded-Increase: Yes/No*
If your use of medical support services has changed, to what do you attribute the change?	*Open response*
Are you currently experiencing any physical injury or illness you are concerned about and that may negatively affect your performance, but have not yet reported to your physician or medical services?	Yes No
Mental Health Support Services Utilization	
To your knowledge, are mental health services consistently available / accessible to you during your work day or shift (as appropriate)?	Yes No I don't know *Other – Open response*
Have you ever sought assistance for a personal mental health / behavioral health concern (i.e., depression, anxiety, sleep, stress, etc.) or a relational problem (i.e., marital stress or familial discord) from your MTF or local medical / mental health clinic?	Yes No

In general, since your current assignment, has your use of mental health support services changed (e.g., mental health counselor, Military and Family Life Consultant)?	Yes No NA
If yes, how has it changed?	Use of support services has decreased Use of support services has increased *Recoded-Increase: Yes/No*
If your use of mental health support services has changed, to what do you attribute the change?	*Open response*
Have you ever sought assistance for a mental / behavioral health concern (i.e., depression, anxiety, sleep, stress, etc.) or relational problem (i.e., marital stress or family discord) from your unit's embedded Operational Health Personnel / Team?	Yes No
Which category best describes the embedded provider(s) you saw: (select all that apply)	Military medical provider and / or technician Military operational psychologist and / or mental health technician Preservation of the Force and Family (POTFF) psychology personnel Military Family Life Counselors Director of Psychological Health Employee Assistance Services I don't know *Other – open response*
Prescription Medication Utilization	
Has your use of prescription medication(s) changed since arrival at your current assignment?	Yes No
If yes, how has it changed?	It has increased It has decreased *Recoded-Increase: Yes/No*
To what do you attribute the change?	*Open response*
Over-The-Counter Medication Utilization	
Has your use of OTC medication changed since arrival at your current assignment?	Yes No
If yes, how has it changed?	It has increased It has decreased *Recoded-Increase: Yes/No*
To what do you attribute the change?	*Open response*

This page intentionally left blank.

APPENDIX C

Alcohol, Tobacco Health Behaviors Split into 18-25 and 26+ Years Age Range Groups

Table C-1. Alcohol Health Behaviors Split by Age Range Groups for Males

Alcohol Use	18-25 Years							26+ Years								Age Range Sig. Prop $p<0.05$
	AD Intel		AD Non-Intel		ANG/Res Intel		Sig. Prop $p<0.05$	AD Intel		AD Non-Intel		ANG/Res Intel		ANG/Res Non-Intel		Sig. Prop $p<0.05$	
	n	%	n	%	n	%		n	%	n	%	n	%	n	%		
Alcohol Frequency																	
Never	55	21.40	13	18.84	5	45.45	*ns*	93	13.98	25	18.80	28	19.44	5	15.63	*ns*	AD I
Monthly or less	87	33.85	25	36.23	3	27.27	*ns*	244	36.69	63	47.37	47	32.64	9	28.13	*ns*	*ns*
2-4x a month	76	29.57	24	34.78	3	27.27	*ns*	194	29.17	34	25.56	43	29.86	10	31.25	*ns*	*ns*
2-3x a week	28	10.89	6	8.70	0	0.00	--	107	16.09	10	7.52	22	15.28	3	9.38	*ns*	*ns*
4+ x a week	11	4.28	1	1.45	0	0.00	--	27	4.06	1	0.75	4	2.78	5	15.63	*ns*	*ns*
Drinks Per Day																	
0	124	49.21	26	37.68	8	72.73	*ns*	246	37.16	55	41.67	52	36.36	11	34.38	*ns*	AD I
1-2	94	37.30	29	42.03	3	27.27	*ns*	327	49.40	59	44.70	67	46.85	16	50.00	*ns*	AD I
3-4	30	11.90	12	17.39	0	0.00	*ns*	80	12.08	16	12.12	22	15.38	5	15.63	*ns*	*ns*
5+	4	1.59	2	2.90	0	0.00	--	9	1.36	2	1.52	2	1.40	0	0.00	--	--
6+ Drinks per Occasion																	
Never	147	58.10	32	46.38	7	63.64	*ns*	475	71.75	92	70.23	105	72.92	21	65.63	*ns*	AD I; AD NI
Less than monthly	87	34.39	30	43.48	4	36.36	*ns*	156	23.56	32	24.43	34	23.61	7	21.88	*ns*	AD I; AD NI
Monthly	15	5.93	7	10.14	0	0.00	*ns*	22	3.32	6	4.58	5	3.47	4	12.50	*ns*	*ns*
Weekly/daily	4	1.58	0	0.00	0	0.00	--	9	1.36	1	0.76	0	0.00	0	0.00	--	--
AUDIT-C Threshold																	
Above	55	22.09	19	27.54	0	0.00	*ns*	113	17.23	16	12.21	25	17.48	6	18.75	*ns*	*ns*
Below	194	77.91	50	72.46	11	100.00	--	543	82.77	115	87.79	118	82.52	26	81.25	--	--
AUDIT-C Secondary Threshold																	
Above	53	21.29	19	27.54	0	0.00	*ns*	106	16.16	16	12.21	23	16.08	5	15.63	*ns*	AD NI
Below	196	78.71	50	72.46	11	100.00	--	550	83.84	115	87.79	120	83.92	27	84.38	--	--
Alcohol Increase[a]																	
Yes	53	20.62	10	14.49	1	9.09	*ns*	64	9.62	10	7.52	15	10.42	4	12.50	*ns*	AD I

AD I = AD intel; AD NI = AD non-intel; *ns* = not significant.

[a]Group n's for response to alcohol frequency item (males only) used as the denominator. No column for ANG/Res non-intel in the 18-25 age range because of low n (n = 2).

Table C-2. Alcohol Health Behaviors Split by Age Range Groups for Females

Alcohol Use	18-25 Years							26+ Years								Age Range Sig. Prop $p<0.05$
	AD Intel		AD Non-Intel		ANG/Res Intel		Sig. Prop $p<0.05$	AD Intel		AD Non-Intel		ANG/Res Intel		ANG/Res Non-Intel		Sig. Prop $p<0.05$	
	n	%	n	%	n	%		n	%	n	%	n	%	n	%		
Alcohol Frequency																	
Never	30	20.98	4	26.67	2	28.57	--	34	16.50	7	17.50	7	14.00	1	8.33	*ns*	*ns*
Monthly or less	63	44.06	2	13.33	2	28.57	--	83	40.29	21	52.50	21	42.00	5	41.67	*ns*	*ns*
2-4x a month	32	22.38	8	53.33	3	42.86	*ns*	67	32.52	8	20.00	15	30.00	3	25.00	*ns*	*ns*
2-3x a week	13	9.09	1	6.67	0	0.00	--	17	8.25	4	10.00	3	6.00	3	25.00	--	*ns*
4+ x a week	5	3.50	0	0.00	0	0.00	--	5	2.43	0	0.00	4	8.00	0	0.00	--	--
Drinks Per Day																	
0	71	50.00	7	46.67	6	85.71	*ns*	78	38.05	16	40.00	13	26.53	3	25.00	*ns*	*ns*
1-2	57	40.14	7	46.67	1	14.29	*ns*	113	55.12	23	57.50	36	73.47	9	75.00	*ns*	AD intel
3-4	14	9.86	1	6.67	0	0.00	--	9	4.39	1	2.50	0	0.00	0	0.00	--	*ns*
5+	0	0.00	0	0.00	0	0.00	--	5	2.44	0	0.00	0	0.00	0	0.00	--	--
6+ Drinks per Occasion																	
Never	108	76.06	11	73.33	7	100.00	*ns*	171	83.82	37	92.50	46	92.00	11	91.67	*ns*	*ns*
Less than monthly	27	19.01	4	26.67	0	0.00	--	30	14.71	3	7.50	3	6.00	1	8.33	--	*ns*
Monthly	5	3.52	0	0.00	0	0.00	--	2	0.98	0	0.00	1	2.00	0	0.00	--	--
Weekly/daily	2	1.41	0	0.00	0	0.00	--	1	0.49	0	0.00	0	0.00	0	0.00	--	--
AUDIT-C Threshold																	
Above	32	22.54	4	26.67	0	0.00	--	43	21.08	6	15.00	8	16.33	3	25.00	*ns*	*ns*
Below	110	77.46	11	73.33	7	100.00	--	161	78.92	34	85.00	41	83.67	9	75.00	--	--
AUDIT-C Secondary Threshold																	
Above	26	18.31	3	20.00	0	0.00	--	29	14.22	3	7.50	2	4.08	1	8.33	--	*ns*
Below	116	81.69	12	80.00	7	100.00	--	175	85.78	37	92.50	47	95.92	11	91.67	--	--
Alcohol Increase[a]																	
Yes	40	27.97	2	13.33	0	0.00	--	24	11.65	10	25.00	6	12.00	1	8.33	*ns*	AD intel

ns = not significant.

[a]group ns for response to alcohol frequency item (females only) used as the denominator. No column for ANG/Res non-intel in the 18-25 age range because of low n (n = 1).

Table C-3. Tobacco Health Behaviors Split by Age Range Groups

Tobacco Variables	18-25 Years							26+ Years							Age Range Sig. Prop *p*<0.05
	AD Intel		AD Non-Intel		ANG/Res Intel		Sig. Prop *p*<0.05	AD Intel		AD Non-Intel		ANG/Res Intel		Sig. Prop *p*<0.05	
	n	%	n	%	n	%		n	%	n	%	n	%		
Any Current Use															
Yes	54	13.33	17	20.24	3	15.79	*ns*	149	17.01	29	16.57	19	9.64	*ns*	*ns*
No	351	86.67	67	79.76	16	84.21	--	727	82.99	146	83.43	178	90.36	--	--
Types of Tobacco Use															
Smoking Tobacco	36	8.89	9	10.71	1	5.26	*ns*	90	10.27	19	10.86	14	7.11	*ns*	*ns*
Smokeless Tobacco	15	3.70	3	3.57	0	0.00	--	39	4.45	9	5.14	4	2.03	--	*ns*
Nicotine Alternatives	22	5.43	12	14.29	2	10.53	--	45	5.14	6	3.43	4	2.03	--	AD non-intel
Any Tobacco Increase															
Yes	26	6.42	3	3.57	1	5.26	--	47	5.37	7	4.00	8	4.06	*ns*	*ns*

ns = not significant.

Note: Group n's in response to tobacco current use item used as the denominator for all items in table. ANG/Res non-intel group excluded from table because of low n for any current tobacco use for 18-25 (n=3) and 26+ (n=2).

Table C-4. Caffeine Health Behaviors Split by Age Range Groups

Caffeine Variables	18-25 Years							26+ Years								Age Range Sig. Prop $p<0.05$
	AD Intel		AD Non-Intel		ANG/Res Intel		Sig. Prop $p<0.05$	AD Intel		AD Non-Intel		ANG/Res Intel		ANG/Res Non-Intel		Sig. Prop $p<0.05$	
	n	%	n	%	n	%		n	%	n	%	n	%	n	%		
Caffeine Consumption																	
Yes	302	74.38	54	64.29	12	66.67	*ns*	716	81.46	131	75.29	162	81.82	37	82.22	*ns*	*ns*
No	104	25.62	30	35.71	6	33.33	--	163	18.54	43	24.71	36	18.18	8	17.78	--	--
Types of Caffeine																	
Caffeinated Tea	149	36.70	19	22.62	4	22.22	*ns*	305	34.70	44	25.29	72	36.36	16	35.56	*ns*	*ns*
Standard Coffee	212	52.22	35	41.67	7	38.89	*ns*	526	59.84	81	46.55	121	61.11	26	57.78	AB	*ns*
Caffeinated Soda	136	33.50	34	40.48	6	33.33	*ns*	348	39.59	71	40.80	79	39.90	24	53.33	*ns*	*ns*
Espresso Based	98	24.14	17	20.24	4	22.22	*ns*	232	26.39	46	26.44	59	29.80	7	15.56	*ns*	*ns*
Energy Drink	151	37.19	32	38.10	6	33.33	*ns*	288	32.76	54	31.03	42	21.21	16	35.56	AC	*ns*
Caffeine or Energy Supplements																	
Yes	31	7.64	5	5.95	1	5.56	*ns*	53	6.03	8	4.60	14	7.07	2	4.44	*ns*	*ns*
Traditional Caffeine Portions Per Day																	
1-2	115	28.33	21	25.00	8	44.44	*ns*	278	31.63	48	27.59	55	27.78	14	31.11	*ns*	*ns*
3-4	87	21.43	13	15.48	1	5.56	*ns*	236	26.85	43	24.71	66	33.33	11	24.44	*ns*	*ns*
5+	82	20.20	13	15.48	3	16.67	*ns*	168	19.11	31	17.82	34	17.17	12	26.67	*ns*	*ns*
Designer Energy Portions Per Day																	
1-2	11	27.34	21	25.00	6	33.33	*ns*	227	25.82	37	21.26	29	14.65	10	22.22	*ns*	*ns*
3-4	24	5.91	5	5.95	0	0.00	*ns*	27	3.07	8	4.60	6	3.03	1	2.22	*ns*	*ns*
5+	11	2.71	4	4.76	0	0.00	--	11	1.25	3	1.72	1	0.51	3	6.67	--	*ns*
Traditional & Designer Energy Drinks																	
Yes	134	33.00	27	32.14	6	33.33	*ns*	243	27.65	43	24.71	35	17.68	14	31.11	AC	*ns*
Caffeine Increase																	
Yes	155	38.18	12	14.29	6	33.33	AB	291	33.11	34	19.54	48	24.24	8	17.78	AB	*ns*

A = AD intel; B = AD non-intel; C = ANG/Res intel; D = ANG/Res non-intel; *ns* = not significant.
Note: Group n's based on response to caffeine consumption item used as the denominator for all items in table. ANG/Res non-intel group excluded from table because of low n for 18-25 (n=3). Comparison category for Types of Caffeine categories is *no*.

APPENDIX D

Results for ANG and Reserves Intel and Non-Intel Groups

D.1 Demographics

The breakdown of ANG and Reserves participants was as follows: 139 ANG intel, 45 ANG non-intel, 173 Reserves intel, and 28 Reserves non-intel. It is important to note that the lack of significant results in this appendix is partially a result of the low sample sizes for the groups, especially proportion comparisons for the groups broken out into shift workers and standard day workers.

Frequencies for demographics and occupational variables for the four groups, and a summary of significant proportion comparisons, are shown in Table D-1. No demographic proportion comparisons were significant for:

- ANG intel compared to ANG non-intel
- Reserves intel compared to Reserves non-intel

A larger proportion of ANG intel when compared to Reserves intel reported:

- Male
- Married
- More than 24 months in their current duties
- Shift workers; and rotating shift frequency; for both the less than or equal to 60 days and 61 days or more time ranges

A larger proportion of ANG non-intel when compared to Reserves non-intel reported:

- Male

Additionally, when splitting the groups into those who work shift work and those who work standard days, no differences were significant *within groups*. The following comparisons were significant *among shift workers*:

- A larger proportion of ANG intel shift workers rotated shifts every 60 days or less when compared to Reserves intel shift workers (n=23, 34.85% vs. n=7, 12.96%).

A summary of significant findings for the multinomial logistic regressions follows:

- ANG intel had 3.09 [95% CI: 1.79-5.32] times greater odds of being male than Reserves intel.
- ANG intel had 1.99 [95% CI: 1.18-3.37] times greater odds of being married than Reserves intel.
- ANG intel had 1.89 [95% CI: 1.20-2.99] times greater odds of being in their current duties more than 24 months than Reserves intel.
- ANG intel had 2.26 [95% CI: 1.42-3.59] times greater odds of being shift workers than Reserves intel.

Table D-1. ANG and Reserves DCGS Demographics, Occupational Variables, and Significant Proportion Comparisons

Demographics and Occupational Variables	ANG Intel		ANG Non-Intel		Res Intel		Res Non-Intel		Sig. Proportion Comparisons
	n	%	n	%	n	%	n	%	$p<0.05$
Gender									
Male	113	83.09	36	85.71	105	61.40	13	46.43	BD; AC
Female	23	16.91	6	14.29	66	38.60	15	53.57	--
Age Range (yr)									
18-25	11	7.91	2	4.44	15	8.72	1	3.57	*ns*
26-35	54	38.85	17	37.78	76	44.19	13	46.43	*ns*
36+	74	53.24	26	57.78	81	47.09	14	50.00	*ns*
Marital Status									
Single	28	20.59	12	28.57	58	34.12	10	37.04	CA
Married	108	79.41	30	71.43	112	65.88	17	62.96	--
Dependents at Home									
Yes	83	59.71	26	57.78	94	54.97	17	60.71	*ns*
No	56	40.29	19	42.22	77	45.03	11	39.29	--
Rank Range									
Enlisted	114	82.61	42	93.33	122	71.35	27	96.43	*ns*
Officer	24	17.39	3	6.67	49	28.65	1	3.57	--
Time on Station (mo)									
≤24	63	45.32	16	36.36	102	61.08	17	60.71	CA
>24	76	54.68	28	63.64	65	38.92	11	39.29	--
Shift Schedule									
Standard Day	65	46.76	25	58.14	111	66.47	16	59.26	CA
Shift Work	74	53.24	18	41.86	56	33.53	11	40.74	--
Shift Rotation Frequency (d)									
≤60	26	20.00	3	6.98	7	4.32	0	0.00	AC
61+	20	15.38	6	13.95	11	6.79	1	3.85	AC
Fixed Shift	29	22.31	8	18.60	29	17.90	6	23.08	*ns*
N/A	55	42.31	26	60.47	115	70.99	19	73.08	CA
Hours Worked per Week									
30-50	115	85.19	36	92.31	124	82.67	19	86.36	*ns*
51+	20	14.81	3	7.69	26	17.33	3	13.64	--

A = ANG intel; B = ANG non-intel; C = Reserves intel; D = Reserves non-intel; *ns* = not significant.

D.2 Sleep and Physical Exercise Health Behaviors

Frequencies for sleep and physical exercise health behaviors for the four groups, and a summary of significant proportion comparisons, are shown in Table D-2. No comparisons were significant for:

- ANG intel compared to ANG non-intel

A larger proportion of ANG intel when compared to Reserves intel reported:

- Difficulty commuting to/from work in the past month

A larger proportion of ANG non-intel when compared to Reserves non-intel reported:

- Sleeping 7-8 hours before work

A larger proportion of Reserves intel when compared to Reserves non-intel reported:

- Sleeping 7-8 hours before work

Additionally, when splitting the groups into those who work shift work and those who work standard days, no differences were significant *among shift workers*. The following comparisons were significant *within groups*:

- A larger proportion of ANG intel shift workers reported their work schedule did not allow them to meet their fitness requirements when compared to ANG intel standard day workers (n=23, 36.51% vs. n=6, 12.00%).

A summary of significant findings for the multinomial logistic regressions follows:

- ANG intel had 2.64 [95% CI: 1.38-5.05] times greater odds of reporting they had difficulty commuting to/from work in the past month compared to Reserves intel.

Table D-2. ANG and Reserves DCGS Sleep and Exercise Health Behaviors and Significant Proportion Comparisons

Sleep and Exercise Variables	ANG Intel		ANG Non-Intel		Reserves Intel		Reserves Non-Intel		Sig. Prop Comparisons
	n	%	n	%	n	%	n	%	$p<0.05$
Hours of Sleep Before Work									
≤4	10	8.85	1	3.45	6	5.94	3	17.65	*ns*
5-6	58	51.33	15	51.72	43	42.57	10	58.82	*ns*
7-8	43	38.05	12	41.38	51	50.50	4	23.53	CD; BD
9+	2	1.77	1	3.45	1	0.99	0	0.00	--
Feel Adequately Rested for Work									
Yes	64	57.66	19	67.86	65	65.00	11	64.71	*ns*
No	47	42.34	9	32.14	35	35.00	6	35.29	--
Difficulty Commuting to/from Work									
Yes	39	34.82	8	27.59	17	16.83	2	11.76	AC
No	73	65.18	21	72.41	84	83.17	15	88.24	--
Sought RX to Aid in Sleep									
Yes	21	18.58	0	0.00	2	1.98	0	0.00	--
No	92	81.42	30	100.00	99	98.02	17	100.00	--
Sought OTC to Aid in Sleep									
Yes	29	25.66	10	33.33	16	15.84	3	17.65	--
No	84	74.34	20	66.67	85	84.16	14	82.35	--
If Taking Sleep Medication, Received Timing of Medication Education[a]									
Yes	22	15.83	2	4.44	6	3.47	1	3.57	*ns*
No	17	12.23	9	20.00	19	10.98	1	3.57	*ns*
N/A	73	52.52	19	42.22	76	43.93	15	53.57	*ns*
Aerobic Exercise per Week									
None	9	7.96	2	6.67	8	8.00	1	5.88	*ns*
1-2 times	40	35.40	8	26.67	28	28.00	7	41.18	*ns*
3-4 times	51	45.13	18	60.00	53	53.00	7	41.18	*ns*
5-6 times	12	10.62	1	3.33	8	8.00	2	11.76	*ns*
Daily	1	0.88	1	3.33	3	3.00	0	0.00	--
Strength Training per Week									
None	22	19.47	9	30.00	18	18.00	4	23.53	*ns*
1-2 times	57	50.44	10	33.33	40	40.00	9	52.94	*ns*
3-4 times	24	21.24	8	26.67	34	34.00	4	23.53	*ns*
5-6 times	9	7.96	3	10.00	6	6.00	0	0.00	*ns*
Daily	1	0.88	0	0.00	2	2.00	0	0.00	--
Schedule Allows for Fitness Requirements									
Yes	71	62.83	25	83.33	70	69.31	10	58.82	*ns*
No / Not Sure	42	37.17	5	16.67	31	30.69	7	41.18	--

A = ANG intel; B = ANG non-intel; C = Reserves intel; D = Reserves non-intel; *ns* = not significant.
[a]Group n used as the denominator.

D.3 Poor Health Habits (Alcohol, Tobacco, Caffeine Use)

D.3.1 Alcohol Use. Frequencies for alcohol health behaviors for the four groups split by gender, and a summary of significant proportion comparisons, are shown in Table D-3 for males and Table D-4 for females. No significant proportion comparisons were found for males or females. Additionally, when splitting the groups into those who work shift work and those who work standard days, no comparisons were significant at $p<0.05$. No multinomial logistic regression results were significant.

Table D-3. ANG and Reserves DCGS Alcohol Health Behaviors and Significant Proportion Comparisons for Males

Alcohol Variables	ANG Intel		ANG Non-Intel		Reserves Intel		Reserves Non-Intel		Sig. Proportion Comparisons $p<0.05$
	n	%	n	%	n	%	n	%	
Alcohol Frequency									
Never	24	26.37	5	20.83	9	14.06	1	10.00	*ns*
Monthly or less	27	29.67	10	41.67	23	35.94	4	40.00	*ns*
2-4x a month	25	27.47	6	25.00	21	32.81	1	10.00	*ns*
2-3x a week	11	12.09	2	8.33	11	17.19	4	40.00	*ns*
4+ x a week	4	4.40	1	4.17	0	0.00	0	0.00	--
Drinks per Day									
0	38	42.22	11	45.83	22	34.38	1	10.00	*ns*
1-2	37	41.11	12	50.00	33	51.56	5	50.00	*ns*
3-4	14	15.56	1	4.17	8	12.50	4	40.00	*ns*
5+	1	1.11	0	0.00	1	1.56	0	0.00	--
6+ Drinks per Occasion									
Never	64	70.33	18	75.00	48	75.00	4	40.00	*ns*
< Monthly	23	26.37	5	20.83	14	21.88	3	30.00	*ns*
Monthly	3	3.30	1	4.17	2	3.13	3	30.00	*ns*
Weekly/daily	0	0.00	0	0.00	0	0.00	0	0.00	--
AUDIT-C Threshold									
Above	17	18.89	2	8.33	8	12.50	4	40.00	*ns*
Below	73	81.11	22	91.67	56	87.50	6	60.00	--
AUDIT-C Secondary Threshold									
Above	15	16.67	1	4.17	8	12.50	4	40.00	*ns*
Below	75	83.33	23	95.83	56	87.50	6	60.00	--
Alcohol Increase[a]									
Yes	13	14.29	1	4.17	3	4.69	3	30.00	*ns*

ns = not significant.
[a]Group n's for response to alcohol frequency item (males only) used as the denominator.

Table D-4. ANG and Reserves DCGS Alcohol Health Behaviors and Significant Proportion Comparisons for Females

Alcohol Variables	ANG Intel		ANG Non-Intel		Reserves Intel		Reserves Non-Intel		Sig. Proportion Comparisons $p<0.05$
	n	%	n	%	n	%	n	%	
Alcohol Frequency									
Never	4	21.05	1	20.00	5	13.16	0	0.00	*ns*
Monthly or less	6	31.58	1	20.00	17	44.74	4	57.14	*ns*
2-4x a month	2	10.53	2	40.00	16	42.11	1	14.29	--
2-3x a week	3	15.79	1	20.00	0	0.00	2	28.57	--
4+ x a week	4	21.05	0	0.00	0	0.00	0	0.00	--
Drinks per Day									
0	5	26.32	1	20.00	14	37.84	2	28.57	*ns*
1-2	14	73.68	4	80.00	23	62.16	5	71.43	*ns*
3-4	0	0.00	0	0.00	0	0.00	0	0.00	--
5+	0	0.00	0	0.00	0	0.00	0	0.00	--
6+ Drinks per Occasion									
Never	18	94.74	5	100.00	35	92.11	6	85.71	--
< Monthly	1	5.26	0	0.00	3	7.89	1	14.29	--
Monthly	0	0.00	0	0.00	0	0.00	0	0.00	--
Weekly/daily	0	0.00	0	0.00	0	0.00	0	0.00	--
AUDIT-C Threshold									
Above	7	36.84	1	20.00	1	2.70	2	28.57	--
Below	12	63.16	4	80.00	36	97.30	5	71.43	--
AUDIT-C Secondary Threshold									
Above	1	5.26	0	0.00	1	2.70	1	14.29	--
Below	18	94.74	5	100.00	36	97.30	6	85.71	--
Alcohol Increase[a]									
Yes	5	26.32	0	0.00	1	2.63	1	14.29	*ns*

ns = not significant.
[a]Group n's for response to alcohol frequency item (females only) used as the denominator.

D.3.2 Tobacco Use. Frequencies for tobacco health behaviors for the four groups are shown in Table D-5. No significant proportion comparisons were found. Additionally, when splitting the groups into those who work shift work and those who work standard days, no comparisons were significant at $p<0.05$. No multinomial logistic regression results were significant.

Table D-5. ANG and Reserves DCGS Tobacco Health Behaviors and Significant Proportion Comparisons

Tobacco Variables	ANG Intel		ANG Non-Intel		Reserves Intel		Reserves Non-Intel		Sig. Proportion Comparisons
	n	%	n	%	n	%	n	%	$p<0.05$
Any Current Use									
Yes	14	12.39	1	3.33	8	7.77	1	5.88	*ns*
No	99	87.61	29	96.67	95	92.23	16	94.12	--
Types of Tobacco Use[a]									
Smoking Tobacco	12	10.62	1	3.33	3	2.91	1	5.88	--
Smokeless Tobacco	2	1.77	0	0.00	2	1.94	0	0.00	--
Nicotine Alternatives	1	0.88	0	0.00	5	4.85	0	0.00	*ns*
Any Tobacco Increase[a]									
Yes	5	4.42	0	0.00	4	3.88	0	0.00	--

ns = not significant.
[a]Group n's in response to tobacco current use item used as the denominator. Smoking Tobacco defined as cigarettes, cigars, and tobacco pipes. Smokeless Tobacco defined as chew, dip, and snuff. Nicotine Alternatives defined as e-cigarettes and nicotine gum.

D.3.3 Caffeine/Energy Supplement Consumption. Frequencies for caffeinated health behaviors for the four groups are shown in Table D-6. No comparisons were significant for:

- ANG non-intel compared to Reserves non-intel
- Reserves intel compared to Reserves non-intel

A larger proportion of ANG intel when compared to ANG non-intel reported:

- Caffeine increase

A larger proportion of ANG intel when compared to Reserves intel reported:

- Caffeine increase

Additionally, when splitting the groups into those who work shift work and those who work standard days, no comparisons were significant at $p<0.05$.

A summary of significant findings for the multinomial logistic regressions follows:

- ANG intel had 3.01 [95% CI: 1.10-8.20] times greater odds of reporting an increase in caffeine consumption compared to ANG non-intel.
- ANG intel had 3.69 [95% CI: 1.96-6.99] times greater odds of reporting they had difficulty commuting to/from work in the past month compared to Reserves intel.

Table D-6. ANG and Reserves DCGS Caffeine Health Behaviors and Significant Proportion Comparisons

Caffeine Variables	ANG Intel		ANG Non-Intel		Reserves Intel		Reserves Non-Intel		Sig. Proportion Comparisons $p<0.05$
	n	%	n	%	n	%	n	%	
Caffeine Consumption									
Yes	89	78.76	24	80.00	85	82.52	13	76.47	*ns*
No	24	21.24	6	20.00	18	17.48	4	23.53	--
Consumption Types									
Caffeinated Tea	35	30.97	8	26.67	41	39.81	8	47.06	*ns*
Standard Coffee	64	56.64	16	53.33	64	62.14	11	64.71	*ns*
Caffeinated Soda	49	43.36	18	60.00	36	34.95	6	35.29	*ns*
Espresso Based	31	27.43	2	6.67	32	31.07	5	29.41	*ns*
Energy Drink	25	22.12	10	33.33	23	22.33	6	35.29	*ns*
Caffeine or Energy Supplements									
Yes	8	7.08	2	6.67	7	6.80	0	0.00	*ns*
Traditional Caffeine Portions Per Day									
1-2	30	26.55	10	33.33	33	32.04	4	23.53	*ns*
3-4	36	31.86	7	23.33	31	30.10	4	23.53	*ns*
5+	19	16.81	7	23.33	18	17.48	5	29.41	*ns*
Energy Drink Portions Per Day									
1-2	16	14.16	6	20.00	19	18.45	4	23.53	*ns*
3-4	4	3.54	0	0.00	2	1.94	1	5.88	--
5+	1	0.88	3	10.00	0	0.00	0	0.00	--
Consume Traditional & Energy Drinks									
Yes	20	17.70	9	30.00	21	20.39	5	29.41	*ns*
Caffeine Increase									
Yes	38	33.63	5	16.67	16	15.53	3	17.65	AC; AB

A = ANG intel; B = ANG non-intel; C = Reserves intel; *ns* = not significant.
Note: Group n's in response to caffeine consumption item used as the denominator for all items in table.

D.4 Medical Conditions Created by or Made Worse by Current Duties

Participants were asked to check off from a list of any medical conditions or symptoms believed to be caused or made worse by their current duties or occupational stress. In addition, an *other* category was provided for open-ended text responses. Open responses were incorporated into existing categories, when applicable. Some of the survey categories were then combined into larger categories for analysis (see Appendix B for further clarification). The number and group proportions for the five most common endorsements, with a summary of the significant comparisons among group proportions, are shown in Table D-7. Anxiety and depression remained as independent categories; however, we note the individuals who reported both categories as well in the table.

No comparisons were significant for:

- ANG non-intel compared to Reserves non-intel
- Reserves intel compared to Reserves non-intel

A larger proportion of ANG intel when compared to ANG non-intel reported:

- Musculoskeletal injury/pain

A larger proportion of ANG intel when compared to Reserves intel reported:

- Headaches, eye strain/vision problems
- Sleep problems
- Depression

Additionally, when splitting the groups into those who work shift work and those who work standard days, no comparisons were significant at $p<0.05$.

Table D-7. ANG and Reserves Most Frequency Cited Self-Reported Conditions Perceived to be Created or Worsened by their Current Duties or Occupational Stress and Significant Proportion Comparisons

Medical Condition	ANG Intel		ANG Non-Intel		Reserves Intel		Reserves Non-Intel		Sig. Proportion Comparisons
	n	%	n	%	n	%	n	%	$p<0.05$
Headaches, eye strain/vision problems	52	37.41	8	17.78	34	19.65	6	21.43	AC
Musculoskeletal injury/pain (e.g., back, neck, joint pain)	36	25.90	3	6.67	31	17.92	5	17.86	AB
Sleep problems (e.g., insufficient sleep)	40	28.78	7	15.56	13	7.51	3	10.71	AC
Anxiety	15	10.79	2	4.44	13	7.51	4	14.29	*ns*
High blood pressure	13	9.35	3	6.67	5	2.89	1	3.57	*ns*
Depression	7	5.04	3	6.67	5	2.89	1	3.57	AC
Both depression and anxiety	3	2.16	2	4.44	5	2.89	1	3.57	--

A = ANG intel; B = ANG non-intel; C = Reserves intel; *ns* = not significant.
Note: Group n's used as the denominator.

D.5 Healthcare Utilization Since Current Unit Assignment

D.5.1 Mental Health Services Utilization. Frequencies for availability of mental health services, seeking assistance from a local mental health or medical facility, and increase in mental health services utilization for the four groups are shown in Table D-8. Proportion comparisons among groups were not significant at $p<0.05$. Additionally, when splitting the groups into those who work shift work and those who work standard days, no comparisons were significant at $p<0.05$.

D.5.2 Medical Health Services Utilization. Frequencies for increased medical health services utilization and unreported injury or illness are shown in Table D-8. Proportion comparisons among groups were not significant at $p<0.05$. Additionally, when splitting the groups into those who work shift work and those who work standard days, no comparisons were significant at $p<0.05$.

D.6 Changes in Prescription and OTC Medication Use

D.6.1 Prescription Medication Use. Frequencies for increase in prescription medication use for the four groups are shown in Table D-9. Proportion comparisons among groups were not significant at $p<0.05$. Additionally, when splitting the groups into those who work shift work and those who work standard days, no comparisons were significant at $p<0.05$. No multinomial logistic regression results were significant.

D.6.2 OTC Medication Use. Frequencies for increase in OTC medication use for the four groups are shown in Table D-9. Proportion comparisons among groups were not significant at $p<0.05$. Additionally, when splitting the groups into those who work shift work and those who work standard days, no comparisons were significant at $p<0.05$. No multinomial logistic regression results were significant.

Table D-8. ANG and Reserves DCGS Mental Health and Medical Utilization and Significant Proportion Comparisons

Healthcare Utilization Variables	ANG Intel		ANG Non-Intel		Reserves Intel		Reserves Non-Intel		Sig. Proportion Comparisons $p<0.05$
	n	%	n	%	n	%	n	%	
Mental Health Services Consistently Available									
Yes	90	78.95	28	93.33	84	81.55	15	83.33	*ns*
No/DK	24	21.05	2	6.67	19	18.45	3	16.67	--
Sought Assistance from MTF or Local Medical/Mental Health Clinic									
Yes	24	21.05	10	33.33	34	32.69	6	33.33	*ns*
No	90	78.95	20	66.67	70	67.31	12	66.67	--
Mental Health Services Increase[a]									
Yes	11	9.65	2	6.67	5	4.90	1	5.56	*ns*
Sought Assistance from Embedded Operational Health Personnel/Team[c]									
Yes	8	5.76	4	8.89	0	0.00	0	0.00	--
No	54	38.85	9	20.00	36	100.00	4	100.00	--
Medical Services Increase[b]									
Yes	24	22.02	0	0.00	13	13.00	2	11.76	*ns*
Unreported Injury or Illness									
Yes	7	6.42	2	6.90	9	9.09	1	5.88	*ns*
No	102	93.58	27	93.10	90	90.91	16	94.12	--

DK = *I don't know* response; *ns* = not significant.
[a]Denominator based on response to "Has use of mental health support services changed" item; ANG intel = 114, ANG non-intel = 30, Reserves intel = 102, Reserves non-intel = 18.
[b]Denominator based on response to "Has use of medical services changed" item; ANG intel = 109, ANG non-intel = 29, Reserves intel = 100, Reserves non-intel = 17.
[c]Denominator based on group n's because of lack of response (>50% in each group) to this item.

Table D-9. ANG and Reserves DCGS Medication Use and Significant Proportion Comparisons

Medication Use Variables	ANG Intel		ANG Non-Intel		Reserves Intel		Reserves Non-Intel		Sig. Proportion Comparisons $p<0.05$
	n	%	n	%	n	%	n	%	
Prescription Use Increase									
Yes	20	18.18	3	10.71	9	8.91	2	11.76	*ns*
OTC Use Increase									
Yes	18	16.51	3	10.34	3	2.97	2	11.76	--

ns = not significant.
Note: Group denominators based on response to prescription use change (ANG intel = 110; ANG non-intel = 28; Reserves intel = 101; and Reserves non-intel = 17) and OTC use change (ANG intel = 109; ANG non-intel = 29; Reserves intel = 101; and Reserves non-intel = 17.

LIST OF ABBREVIATIONS AND ACRONYMS

AD	active duty
AFSC	Air Force Specialty Code
ANG	Air National Guard
CI	confidence interval
DCGS	distributed common ground system
intel	intelligence
ISR	intelligence, surveillance, and reconnaissance
MTF	medical treatment facility
N/A	not applicable
NSDUH	National Survey on Drug Use and Health
OR	odds ratio
OTC	over-the-counter
Res	Reserves
RPA	remotely piloted aircraft
RX	prescription medication
SAMHSA	Substance Abuse and Mental Health Services Administration
USAF	U.S. Air Force
USAFSAM	U.S. Air Force School of Aerospace Medicine